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TROPICAL DISEASES BULLETIN

Vol. 6. 1915. No. 6.

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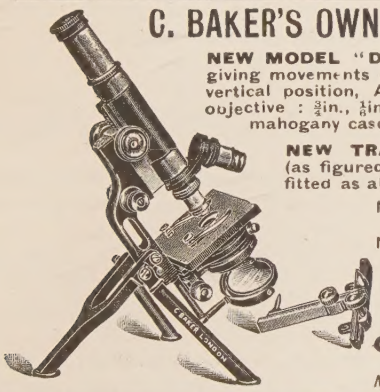

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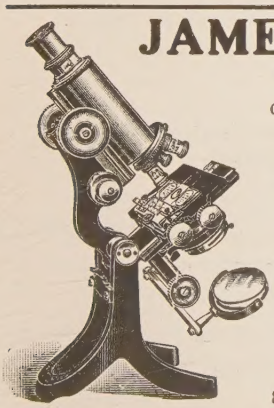

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TROPICAL DISEASES BUREAU.

TROPICAL DISEASES BULLETIN.

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HELMINTHIASIS.

LEIPER (Robert Thomson). **[Report on an Expedition to China to Study the Trematode Infection of Man.]** Unpublished Report to Colonial Office. 1915. Jan. 15. 4 pp. f'cap.

Under date 1st January 1915 Dr. R. T. Leiper reports to the Colonial Office on the expedition undertaken by himself and Surgeon E. L. ATKINSON, R.N., to the Far East to investigate the trematode infections of man. The expedition was cut short by the outbreak of the war, but its main objects had been already attained. It is noted that the occurrence of the various infections of man in domesticated animals, especially dogs, rendered the work independent of hospitals and native patients. Shanghai was fixed upon as the centre, being within easy reach by rail and river boats of the endemic areas of schistosomiasis. *Clonorchis* and *Yokogawa* proved to be endemic in and around Shanghai itself and *Fasciolopsis* was found within two hours. Various molluscs and other possible intermediaries were obtained within a hundred miles of Shanghai by working from a house-boat upon the canals which intersect this region. The summary of results as regards infections other than *Schistosoma japonicum* is as follows :—

" (*a*) The following helminths, which occur as parasites of man, were found in dogs collected by the police from the Shanghai municipal area :— *Clonorchis sinensis*, *Yokogawa yokogawai*, and *Dibothriocephalus latus*. A species of Echinostome, a new Metorchis, *Dirofilaria immitis*, and the common *Ankylostoma caninum* were collected also.

" (*b*) We were unable to establish the complete life history of Clonorchis, but it is noteworthy that no species of trout (which has been shown to be the carrier in Japan) occurs round Shanghai. Houghton has claimed to have found a free-moving cercaria on the mucous membrane of the gut of certain fish from the River Yangtse. We have found a similar body to this, but are convinced that it has nothing to do with the life cycle of Clonorchis. A study of the morphology of these canine Clonorchis throws some light upon the question of duality of species.

" (*c*) *Yokogawa yokogawai* occurred in a large number of the dogs in Shanghai. This parasite has not heretofore been noted as occurring in China. We found in a kind of perch not yet named encysted cercariae, which further work will probably prove to be the larval form of this parasite. The eggs resemble closely those of Clonorchis, and it may be that records of the discovery of Clonorchis eggs in faeces in human cases in Shanghai may be to some degree inaccurate.

" (*d*) *Dibothriocephalus latus* was found in one dog, and the eggs were isolated and set aside to hatch for experimental work. The text-books

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state that even in warm weather a month is required for the proper formation of the embryo. These eggs hatched quite unexpectedly within a fortnight, when we were not thus early prepared to follow their further course. It is a remarkable thing that, although the infection of man and dogs with this form has been repeatedly carried out in feeding experiments with infected fish, no one has yet succeeded in ascertaining whether the fish are directly infected or secondarily through another intermediate host.

"(*e*) The Shanghai dogs were also heavily infected with a species of Echinostome belonging to the genus Echinochasma. We succeeded in recognising the larvae of this form in a fresh-water fish, not yet named, common in the markets of Shanghai, and in experimentally infecting a dog by feeding. This form may prove of further interest, for the egg resembles very closely that of *Fasciolopsis buski*, and it would be not at all surprising to find it as a human parasite of man in China.

"(*f*) A new Metorchis, obtained from the bile ducts of a dog, is of interest as possibly throwing light upon the reputed *Metorchis truncatus* reported from man in Siberia. This form resembles, when stained, *Opisthorchis sibericum* much more closely than does *Metorchis truncatus*. It is small, the skin is covered with spines, the testes are tandem and deeply lobed.

"(*g*) *Dirofilaria immitis* in Shanghai, as in other parts of China, is very common in dogs, but, as its life history has already been traced, it did not seem advisable to devote time to this form.

"(*h*) *Ankylostoma caninum*, the common hook-worm of the dog, occurs in practically every dog examined. We found no other species. This is of interest, in view of the statement in Jeffreys' and Maxwell's "Diseases of China," that *Ankylostoma duodenale* of man occurs also in dogs in Shanghai.

"(*i*) In the public abbatoirs we devoted some attention to the parasites of pigs. *Trichinella spiralis* would appear to be very rare, if it occurs. We did not come across or learn of a single case. The pigs were remarkably free from parasites. The pigs in the south of China are often infested with a species of Fasciolopsis. We received specimens in cold storage from Hong Kong and were able to compare the anatomy with that of typical Fasciolopsis from Shaohsing. All specimens show the same morphology. Differences which have given rise to various specific designations are easily produced by various manipulations. It is especially notable that all specimens, both from pig and man, have spines on the skin in the living state.

"The larval stage of Fasciolopsis is said to encyst in freshwater shrimps. We found these cysts and attempted to infect pigs, but were unsuccessful.

"(*j*) The occurrence of a very good case of ankylostomiasis at Hangchow enabled us to test the practicability of employing chemical manures to destroy ankylostomes in faeces without impairing the organic manurial value. All the commonly used chemical manures were tried, and with one we obtained highly suggestive results. The method must be repeated in a larger series of laboratory experiments, but if these prove equally effective our work may point to a simplification of the nightsoil problem in tropical communities."

An account of the investigation regarding *Schistosoma japonicum* has been published in the *Brit. Med. Jl.* [see below].

A. G. B.

LEIPER (R. T.) & ATKINSON (E. L.). **Observations on the Spread of Asiatic Schistosomiasis. With a Note on "*Katayama nosophora*" by** G. C. ROBSON.—*Brit. Med. Jl.* 1915. Jan. 30. pp. 201–203. With 1 plate and 1 fig.

The authors note that from 1852 when BILHARZ announced the discovery of *Distomum haematobium* down to 1904 no progress was made in the elucidation of the etiology of schistosomiasis. At the

end of 1913 it was reported that MIYAIRI of Kiushu had found a reproductive stage of Schistosoma in a *Lymnaeus* species. The Commission formed by the two authors left England in February 1914 and was engaged in the work until the outbreak of war in August. The headquarters were at Shanghai. "The Looss hypothesis of direct infection was set aside in favour of one to the effect that the schistosome conformed in essentials to the life cycle of other digenetic trematodes." The method employed was "to submit all likely hosts to an overwhelming infection; the proper host will show a marked, even a fatal susceptibility, while other even closely allied hosts will remain uninfected." It was necessary first to obtain an animal with such a heavy infection that the eggs could be separated from the faeces with little contamination. After a search of three months a suitable dog was found, the motions consisting almost entirely of mucus and blood crowded with eggs.

"Our second necessity was to localise a small village with a fairly high percentage of infection amongst the inhabitants, and then study the local molluscan fauna and submit the various species to the 'blunderbuss' test. Further, by dissection of the various molluscs from such a defined area, naturally infected specimens might be found, and the nature of the infection diagnosed:

"(*a*) By certain peculiarities that the cercaria of the schistosome should reveal; and

"(*b*) By a second 'blunderbuss' test to infect a susceptible mammalian host with material from the suspected intermediary host."

They failed to find such a village in the Lower Yangtse Valley. Molluscs were collected and dissected throughout the whole region and cercaria were found but none "presented the one morphological character—absence of pharynx—which would have established a strong presumption in favour of a hypothetical schistosome larva." They then decided to examine Katayama in Japan, where FUJINAMI'S early experimental infections of animals by immersion in paddy field water had been carried out. Large numbers of various species of molluscs were brought to Shanghai, including the form described as *Katayama nosophora*.

"The molluscs from Katayama were submitted to the biological test in Shanghai, and a small brown form with eight spirals and an operculum, named *K. nosophora*, showed an extraordinarily marked attraction for the miracidia, as contrasted with the other species. The small dark head and foot speedily became festooned with little white specks, and it was obvious from the agitated manner in which the snail repeatedly attempted to brush them off that their presence was a cause of considerable irritation. .... In many specimens the liver was found ramified with long intertwining delicate tubes bluntly rounded at the extremities and containing cercariae with bifid tails. .... There was complete absence of pharynx."

A second visit was then paid to Katayama and a large supply of these molluscs was collected. At Shanghai their livers were teased in fresh water and the cercariae allowed to become free and swim about. Laboratory bred mice were then immersed, none of the fluid being allowed near the mouth. A start was then made for home. Three of four mice died within the first few days. At Aden the few molluscs still alive were sacrificed and the last remaining mouse was submitted to infection. This animal was killed a month later in the laboratory of the London School of Tropical Medicine and many male and female schistosomes *in copula* were found in the portal vessels.

A permanent preparation was made of the gut with the mesentery undamaged, showing the paired worms *in situ* in the veins. This is reproduced.

The marked attraction of the mollusc for the miracidium, the peculiar morphological characters of the cercaria and the successful infection of a laboratory-bred mouse from cercaria obtained from Katayama molluscs after several weeks' captivity at sea leave no room for doubt that the schistosome has a life-cycle similar to that of other digenetic trematodes."

An account is given, with figures, of the developmental stages in the mollusc. The authors conclude that the above results confirm Miyairi's main conclusion as to the transmission of *Schistosomum japonicum*. His paper is inaccessible. The only information available is an annotation by Kumagawa in the *Tropical Diseases Bulletin* for March 30, 1914 (Vol. 3, pp. 289–90). Mr. Robson's note describes the new genus and species of mollusc. The points in the paper are clearly illustrated in the plate.

A. G. B.

Cawston (F. G.). **Bilharziosis in Natal.**—*S. African Med. Rec.* 1915. June 12. Vol. 13. No. 11. pp. 160–161.

The author's observations in Maritzburg lead him to conclude :—

"(*a*) That the numerous eggs contained in the bladder of Bilharzia patients do not hatch until they reach fresh water.

"(*b*) That freshwater rivers and pools are quickly infected by Bilharzia patients who pass their urine into them.

"(*c*) That, as the larvae soon die, even in diluted urine, they cannot infect an individual by passing along the urethra, unless they alter their characters considerably before they do so, possibly by route of an intermediate host.

"(*d*) That infected individuals should be warned of the danger to the community of passing their urine into fresh water and warned against entering infected streams.

"(*e*) That uninfected persons who are free from sores or cuts on the skin, and who have been circumcised, are less liable to infection than swimmers who have abrasions of the skin or a long prepuce, which might retain larvae in very diluted urine. And that these persons are less liable to infection if they are careful to wear costumes during bathing and to dry themselves thoroughly on leaving the water.

"(*f*) That treatment should aim at the eradication of the worms from the bloodstream.

"(*g*) That, as the eggs die rapidly in undiluted urine, their presence in the bladder is a matter of secondary importance.

"(*h*) That surgical treatment of the bladder in the acute stage can only aggravate the affection and, where possible, is better avoided in the chronic stage.

"(*i*) That attention should be paid to the bacterial condition of the bladder, the general health and associated anaemia."

R. T. Leiper.

Watkins-Pitchford (W.). **Note on Schistosomiasis.**—*Med. Jl. S. Africa.* 1915. July. Vol. 10. No. 12. p. 226.

As Director of the South African Institute of Medical Research Dr. Watkins-Pitchford communicates the results of some experiments made by Dr. F. G. Cawston on the transmission of the *Schistosoma haematobium*. From a swimming pool at Pietermaritzburg which was generally believed to be a source of bilharzial infection a number of

small snails of the family Limnaeidae—identified by Dr. E. WARREN as *Physopsis africana*—were transferred to a dish containing fresh water and to this a small quantity of urine containing Bilharzia eggs was added. The livers of these snails at first showed no microscopical abnormality. After three weeks however cercariae were found encysted in the liver of one of the snails. Dr. WARREN is stated to have looked upon the observation as merely tentative and deprecates the drawing of definite conclusions. [In a lecture to the Royal Society of Medicine, in July, the annotator described the life cycle of Bilharzia, and the successful experimental infection of monkeys in Egypt.]

R. T. L.

DARLING (S. T.). **The Pathological Features of a Case of Bilharziasis of the Large Bowel in a Martiniquan.**—*Proc. Med. Assoc. Isthmian Canal Zone. Oct.* 1912 *to Mar.* 1913. Vol. 5. Pt. 2. pp. 52–55.

The body was much emaciated. Yellow fluid pus in large quantity was found in the pelvis. The small intestines were matted together by recent adhesions. The descending colon was perforated and its wall, like that of the sigmoid and rectum, was very hard and firmly adherent to adjoining structures. The mucous surface of the rectum was extensively denuded and diffusely bloodstained. The lumens of the sigmoid and descending colon were greatly contracted. The wall of the bowel was greatly thickened by chronic proliferative oedema and abscesses filled with greenish yellow pus. The area involved was that supplied by the inferior mesenteric vein. The liver was atrophied but showed no evidence of infarctions or necrosis.

In sections of the gut the submucosa is greatly increased by round cell infiltration and abscesses. The perivascular channels in the muscular layer and the peritoneum and mesentery are greatly infiltrated; the chronic inflammatory process being due directly to the presence of the ova, at any rate in some places.

In the discussion on the paper Dr. DEEKS and Dr. BAETZ state that most of the recent cases came from Naos Island and occurred in negroes from Martinique and Antigua. In all the cases the ova were lateral spined and special search for terminal spined eggs in the urine was invariably fruitless. The local haematuria is most frequently due to acute posterior gonorrhoea.

R. T. L.

MINERBI (Giacomo). **La centrifugazione frazionata dell' urina per dimostrare l'esistenza di cilindruria in cistitici e particolarmente in bilharziosi.** [The Fractional Centrifugalization of Urine for the Purpose of demonstrating the Presence of Casts in Cystitis, and More Especially in Bilharziasis.]—*Riv. Crit. Clin. Med.* 1915. May 29. Vol. 16. No. 22. pp. 337–343.

The author finds that by centrifugalizing urine in successive stages it is possible to separate the different constituents of the sediment with a great deal of accuracy, owing to their differences in specific gravity. A hand centrifuge must be used. From 15 to 20 turns of the handle will throw down all crystals and amorphous urates along with the ova of Schistosomes. The urine, after being pipetted off from this

sediment, will throw down with a little more centrifuging epithelium cells, blood cells, and masses of blood pigment, if present, while last of all with 100 to 300 turns of the handle casts will come down in a state of almost pure isolation.

J. B. Nias.

Ekins (C. M.). **Four Cases of Bilharziasis under Thymo-Benzol Treatment.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. June. Vol. 8. No. 7. pp 212–213.

Robertson's treatment of bilharziasis with thymol dissolved in benzol was tried on four cases at Alexandria. No benefit resulted and the intoxicating effect was a great nuisance. The patients had to be kept forcibly in bed. Living bilharzia miracidia were obtained at the conclusion of the course of treatment in all four cases.

R. T. L.

Lane (Clayton). *Artyfechinostomum Sufrartyfex.* **A New Parasitic Echinostome of Man.**—*Indian Jl. Med. Res.* 1915. Apr. Vol. 2. No. 4. pp. 977–983. With 1 plate.

Under this distinctive name an echinostome fluke is described as new in man. The material, consisting of sixty-three flukes, was passed by a girl of about eight years of age who had lived all her life on the Ragnik Tea Estate in Assam. The specimens were considerably macerated. They measured about 9 mm. in length with a maximum breadth of 2·5 mm. and a depth of about 0·8 mm. The most prominent naked eye feature is the large central sucker which led the collector to take them for *Fasciolopsis buski*. The ventral and part of the dorsal surface is covered with spines. The collar of spines characteristic of the echinostomes was fairly complete only in one out of forty-one specimens received by Lane for description. Assuming two "collar" spines to be missing the number is 39. Two corner spines are strikingly large. The oral sucker measures 0·2 to 0·3 mm. in diameter and the pharynx is about the same size. The cirrus sac is 2 mm. long. The testes are deeply indented. In two specimens one of the testes was rudimentary. The yolk glands occupy the whole of the lateral parts of the worm from the level of the caudal half of the cirrus sac to the end of the worm. The ova measure 0·09 mm. by 0·075 mm. and have no filament. The parasite is made type of a new genus with the collar spines as a diagnostic feature and placed in the sub-family *Himasthlinae*.

R. T. L.

Hall (Maurice C.) *Taenia saginata.* **A Case presenting Structural Abnormalities and associated with Spurious Parasitism in an Infant.**—*Jl. Amer. Med. Assoc.* 1915. June 12. Vol. 64. No. 24. pp. 1972–1973. With 1 text-fig.

The abnormality recorded in *Taenia saginata* is a meristic variation consisting of the unilateral duplication in one segment of the genital pore, vagina and vas deferens, together with the formation on the opposite side of the segment of a simple rudimentary genital pore.

Whereas the normal adjoining segments measures 15 mm. long and 7 mm. wide this segment was 20 mm. long by 9·5 mm. wide. The uterine branching was somewhat diffuse and irregular and the eggs presented abnormal appearances in shape and did not contain any hexacanth embryos. Accompanying the tapeworm was a beetle larva, *Tenebroides mauritanicus*.

R. T. L.

Moore (John T.). *Sparganum mansoni*. **First Reported American Case. Found in a Breast Tumour at Operation.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Feb. Vol. 2. No. 8. pp. 518–529. With 1 plate: and *Trans. Amer. Soc. Trop. Med.* 1914. Vol. 9. pp. 236–247. With 1 plate.

This occurrence of *Sparganum mansoni* in a native of Texas was accidentally observed as a result of an operation for the removal of "cancerous masses" in the breast. The pectoralis major muscle contained a mass of 2–4 cm. in diameter which when sectioned revealed a white tapelike parasite with active movements coiled in and between the muscle fibres. There was no definite cyst wall. The irregular crevices in the muscle contained eosinophiles and endothelial leucocytes. The worm measured 21·5 cm. in length and was unsegmented. [No anatomical details are given.] The paper concludes with a useful list of the cases of Sparganum hitherto recorded. Including the present there are in all twenty-five records. Of these no less than twenty have been reported from Japan.

R. T. L.

Highet (H. Campbell). **Ankylostomiasis in Siam.** [Correspondence.] —*Lancet*. 1915. July 24. p. 202.

Ankylostomiasis in Siam is due to both *Necator americanus* and *Ankylostoma duodenale*, but the prevalence of each varies in different districts. At Chiengmai Dr. Kerr found *N. americanus* to be the common form, while specimens from Nan were with one exception *A. duodenale*. In Bangkok this latter was the only species found. The disease was especially rife among the Laos and Kamoos of Northern Siam. Dr. Kerr states that in Chiengmai symptoms are uncommon. About fifty worms are usually found in each case. When the total approaches one hundred dyspeptic symptoms are noticeable. In 216 autopsies in Bangkok only ten were found infected although a very careful search was made.

R. T. L.

Harper (P.). **Ankylostomiasis in Fiji.**—*Lancet*. 1914. Sept. 19. pp. 740–741.

In the Navua District of Fiji there are over 2,000 indentured Indian immigrants. The death-rate per 1,000 (excluding the deaths due to accident and violence) amounted to 96·6 in 1910, 48·1 in 1911 and 50·3 in 1912. This appeared almost entirely due to intense ankylostomiasis. An ankylostomiasis campaign was instituted which resulted in the lowering of the death-rate the following year to 26·29.

It is noted that among the measures used the provision of boots was found to be a failure as the coolies did not wear them unless under supervision.

R. T. L.

LEVY (Robert L.). **Oil of Chenopodium in the Treatment of Hookworm Infections.**—*Jl. Amer. Med. Assoc.* 1914. Nov. 28. Vol. 63. No. 22. pp. 1946-1949.

American wormseed oil is a volatile oil distilled from the fruit of a common roadside weed (*Chenopodium anthelminticum*) abundant in the eastern parts of the United States. It is, in the author's experience with two cases reported, an effective vermituge in the treatment of hookworm and is more efficient than thymol; moreover it is not unpleasant to take, is cheap and non-toxic in therapeutic doses, and its ingestion is not followed by disagreeable symptoms. Although it has always been official in the United States Pharmacopœia only twelve cases of chenopodium treatment appear to have been reported to date and these are conveniently summarised in tabular form in this paper. The following method of administration is recommended:—

"First Day: Liquid diet; 8 p.m., 1 ounce of Epsom salt.

"Second Day: Omit breakfast and luncheon; 5 a.m., 1 ounce of Epsom salt; 7 a.m., 9 a.m., and 11 a.m., 16 drops of the oil of chenopodium on a teaspoonful of granulated sugar; 1 p.m., 1 ounce of castor oil containing 50 minims of chloroform. Soft supper.

"Third Day: Resume full diet."

The treatment may be repeated at weekly intervals.

R. T. L.

MOUAT-BIGGS (C. E. F.). **The Treatment of Ankylostomiasis in Venezuela.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. June. Vol. 8. No. 7. p. 216.

In many countries of Tropical America successful and very harmless treatment for trichocephaliasis and ankylostomiasis consists of a spoonful of milk of the higueron (*Ficus laurifolia*) for three days, taken at midday, at night and in the morning with plain or sugared water or in cow's milk. On the fourth morning the patient takes an ounce of Glauber or Epsom salts. The dose is halved for children. It is stated that this treatment is now adopted entirely by the National Board of Health for the entire suppression of ankylostomiasis in Venezuela. In the discussion Dr. Felix PAEZ adds that the latex is even more powerful in its action in intections with Trichocephalus. No unpleasant symptoms are caused and the dose ranges from ten to forty grammes.

R. T. L.

LANE (Clayton). **The Treatment of Ankylostomiasis, or Hookworm Disease.**—*Indian Med. Gaz.* 1915. Vol. 50. No. 7. pp. 241–245.

This article has been written at the request of the Committee of the Darjeeling Planters' Association and should be of use to medical men taking up the systematic treatment of ankylostomiasis on a large scale. The various known methods of treatment are summarised and their

merits discussed from the points of view of cost and efficiency; the information being based apparently on the published experiences of the various ankylostomiasis campaigns. A standard of comparison of the relative cost of treatment by the various drugs is arrived at by multiplying together the unit of dose, the unit of cost and the unit of inverse efficiency. The units of inverse efficiency are the number of separate treatments required to expel the worms and to effect a practical cure. These are stated to be "Eucalyptol" 5, Beta-Naphthol 3, Thymol 2, Chenopodium 2. The unit of dose is the weight of the dose of Beta-naphthol (i.e. 30 grs.) required for a full treatment. On this basis the unit treatment for "Eucalyptol" is equal to 2·6 units, for Thymol 2 units and chenopodium 1·5 units of Beta-naphthol. The unit of cost is the cost per pound in Rupees expressed in decimals.

The formula as applied to pre-war conditions in India is given in the following table:—

Treatment.	Unit of dose.	Unit of cost.	Unit of inverse efficiency.	Relative Cost of Treatment.
Eucalyptol—				
Oil of Eucalyptus	1 ×	2 = 2	6·4 × 5	= 32
Chloroform	1·6 ×	2·75 = 4·4		
Betanaphthol ..	1 ×	3·5	× 3	= 10·5
Thymol ..	2 ×	16	× 2	= 64
Chenopodiol ..	1·5 ×	24	× 2	= 72

[The term "Eucalyptol" is apparently used by Lane as a convenient term for the Eucalyptus-Chloroform mixture.]

R. T. L.

BARLOW (N.). **Treatment of Ground-Itch.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. Feb. Vol. 2. No. 8. p. 530.

Cases of uncomplicated uncinarial dermatitis are relieved immediately and a complete cure is effected in from two to four days by an application twice daily for five minutes of a three per cent. solution of salicylic acid in ethyl alcohol.

R. T. L.

ISMAIL (Abd el Aziz). **Some Points in the Circulatory System in Ankylostomiasis: A New Explanation for the Murmurs.**—*Lancet.* 1915. June 5. pp. 1175–1177.

The following new explanation of the origin of the mitral murmurs in ankylostomiasis is offered. The contraction of the papillary muscles is to prevent the retroversion of the valve flap into the auricle; if this contraction is continued further, it will increase the convexity of the auricular surface of the flaps and would eventually pull the edges of the valves into the ventricle causing them at the same time to separate. A chink would be created, some blood would regurgitate and a murmur systolic in time result. Some facts favouring this safety valve hypothesis are, (1) The murmur is best or only heard in the recumbent

position ; (2) The murmur resembles that of mitral stenosis in being localised to the apex or internal to it ; (3) The presence of doubled first sound at the mitral is in a quarter of the cases apparently due to the vibration of the mitral cusps consequent on overaction of the papillary muscle ; (4) In the last stages the papillary muscles are found to be very fatty and to have increased in bulk as a result of previous hypertrophy and over action ; (5) A similar murmur occurs early in Graves' disease and in overstress from exercise.

R. T. L.

YOKOKAWA (S.). **On the Pathogenesis of *Strongyloides stercoralis*.—** *Far East. Assoc. Trop. Med. C. R. Trois. Congrès Biennal, Saigon (1913).* 1914. pp. 329.

The larvae of *Strongyloides stercoralis* are not harmless as has been generally supposed. They have a strong invasive force and have been found post mortem in the muscles, submucosa and subserosa of the wall of the great intestine where there was a dysenteric ulcer. This migration had taken place before death because the larvae were surrounded by inflammatory infiltration. A certain number of larvae were also found in the wall of the ileum and as emboli in the liver. They were detected also in the lymphatic and blood streams.

R. T. L.

WHARTON (Lawrence D.). **The Development of the Eggs of *Ascaris lumbricoides*.—*Philippine Jl. Sci.*** Sect. B. Trop. Med. 1915. Jan. Vol. 10. No. 1. pp. 19–23.

Ascaris lumbricoides remain alive and active in KRONECKER'S salt solution (0·06 gram NaOH in a litre of normal saline) for twelve days. The females discharge their ova in large numbers, usually at night. From March to May the eggs developed in from ten to fourteen days at ordinary laboratory temperature. The most favourable temperature was found to be 30° C. Although drying does not kill the eggs a small amount of moisture is a necessary requirement for development. Development is temporarily suspended in the entire absence of oxygen although a very small amount only is required. Death rapidly ensues at a temperature over 37° C. Eggs containing well-developed embryos were all killed when placed in tap water at 70° C. and allowed to cool. This point is undoubtedly of considerable practical importance "as many fruits and vegetables which are commonly eaten raw can be dipped into water at this temperature without being injured." The embryos will not survive unless they are completely developed before being introduced into the alimentary canal.

R. T. L.

TAKAKI (Y.). **Intestinal Obstruction caused by *Ascaris lumbricoides*.—** *Sei-i-Kwai Med. Jl.* 1915. May 10. Vol. 34. No. 5. Whole No. 399. pp. 28–29.

Ascarides were found to be the cause of symptoms, in a child of three years of age, which resembled those in intussusception. A long tumour ran across the abdomen from above the umbilicus to the right

side and a small mass was felt in the right iliac fossa. There was acute abdominal pain, anorexia and vomiting. On the day after admission two round-worms were vomited. Santonin was then administered. Altogether 117 ascarids were evacuated and the symptoms thereon completely disappeared.

R. T. L.

Nagahama (M.). **A Case of Severe Abdominal Pain cured by vomiting of One *Ascaris lumbricoides*.**—*Sei-I-Kwai Med. Jl.* 1915. May 10. Vol. 34. No. 5. Whole No. 399. pp. 27–28.

A healthy person 22 years of age had half an hour before breakfast a sudden attack of abdominal pain which was so excruciating as to cause him to double up his legs and press upon the abdomen with the hands. The general symptoms simulated cardiac spasm but could not be relieved by internal administrations or injections. There was nausea and a slight amount of mucus was vomited on several occasions. Next day an ascaris was vomited, whereon all the symptoms vanished.

R. T. L.

Cruickshank (J. A.) & Wright (R. E.). **Filariasis in Cochin.**—*Indian Jl. Med. Research.* 1914. Apr. Vol. 1. No. 4. pp. 741-785. With 1 map and 7 plates.

From a clinical examination of one thousand cases in Cochin it was found that 20·9 per cent. had filaria embryos in the blood and 12·9 per cent. showed signs of elephantiasis; 32·9 per cent. of the general population showed definite signs of filariasis and, if one includes cases showing features usually though not necessarily associated with filariasis, the percentage rises to 72·3 per cent. Fever is very common especially in the early stages of the disease. The fever is well recognised by the inhabitants, who differentiate three varieties: fever associated (*a*) with pain in the groins, (*b*) with pain in the arms, (*c*) with shivering only. Malaria is not indigenous in Cochin. The fever is always associated with inflammation of some part of the lymphatic system, the first two types with superficial lymphangitis and lymphadenitis, the third type with inflammation of the internal lymphatics and glands. The chief pathological feature is stated to be a progressive fibrosis subsequent to inflammatory changes due to the presence of the adult worms and not necessarily associated with a bacterial invasion.

The filaria is almost certainly *Filaria bancrofti*. A careful description is given. The genital papillae in the male varied. There were eleven pairs (six preanals and five postanals) in one specimen and nine pairs (four preanals and five postanals) in another, the interval between the last two pairs being greater than that between any of the others. Out of 120 cases periodicity was observed in thirty-one to be exclusively nocturnal while eighty showed no embryos either by day or night. In nine cases the embryos appeared by day.

From experimental work the authors conclude that *Culex fatigans* is the chief mosquito intermediary in Cochin, that *Nyssomyzomyia rossii* is almost certainly efficient and that *Culex microannulatus* and *Stegomyia scutellaris* may also act as carriers. The filarial metamorphosis in the mosquito is carefully described and illustrated.

Antifilarial measures in Cochin would be difficult owing to climatic and industrial conditions. An artesian water supply would allow most of the mosquito haunts to be abolished. Thymol, potassium iodide and injections of emetine were found to have no good effect.

R. T. L.

Walker (Ernest Linwood). **The Morphology of the Adults of the Filaria found in the Philippine Islands.**—*Philippine Jl. Sci.* Sect. B. Trop. Med. 1914. Nov. Vol. 9. No. 6. pp. 483–491. With 1 plate.

The larval filaria described by Ashburn and Craig as a new species, *Filaria philippinensis*, was based upon material from a single case. Later four other cases with the same characteristics were met with and it was concluded that this form, which exhibited no periodicity, was the only indigenous species. More recently other observers have definitely established the frequent occurrence of a filaria larva with definite nocturnal periodicity. The author examined four adult filariae from a Filipino and gives a detailed description of their morphology. In the male there are three pairs of postanal papillae and at least thirty-two pairs of preanals. These are very small and difficult to see. It is believed that the Philippine filaria is identical with *Filaria bancrofti* as there are no characters that preclude this conclusion. This does not preclude the possibility of another species existing in the Philippines, but in conjunction with the evidence of more recent studies of the larval forms it renders this extremely improbable.

R. T. L.

Mathis (L.). **Quelques Cas de Filariose concernant des Annamites originaires du Delta Tonkinois.**—*Far East Assoc. Trop. Med. C. R. Trois. Congrès Biennal, Saigon* (1913), 1914. pp. 290–293.

Filariasis in Indochina is usually quite compatible with good health, but it occasionally manifests itself in the form of hydrocele, orchi-epidydimitis, adenolymphocele especially crural, and elephantiasis. Fever is also attributable to this cause. Clinical notes of five selected cases are given. One with generalised oedema had the appearance of beriberi. Two had dental affections of filarial origin, the fourth had a retroauricular abscess and the fifth showed rheumatoid symptoms successively in various joints.

R. T. L.

Smith (Allen J.) & Rivas (Damaso). **Notes upon Human Filariasis (*Filaria loa* Guyot, and *Filaria bancrofti* Cobbold).**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1914. Dec. Vol. 2. No. 6. pp. 361–377. With 1 plate.

This paper records some observations upon two cases of *Filaria loa* and three of *Filaria bancrofti* that have come under the authors' notice during the past four years.

The cases of *Filaria loa* were contracted in the Cameroons. The first patient noticed symptoms of discomfort in the eye for the first time

six years after his return to Philadelphia. On examining with a mirror he saw a filaria worm traverse the eyeball in three to five minutes. Areas of cutaneous tenderness and swelling had appeared at intervals during and after his stay in the Cameroons. A male worm was removed from the eye and showed the characteristic cuticular bosses. There were two pairs of post-anal papillae and four pairs of preanals. In these and other characters the authors believe that their species differs from *Filaria loa.*

In the second case the embryos of *Filaria loa* had been recognised in the blood during a stay of 12 years in Africa and an adult worm had been extracted from the subcutaneous tissue of the upper anterior left chest wall. Calabar swellings were of frequent occurrence. The patient had choreiform movements of the head and complained of loss of memory and of mental fatigue. The blood showed a moderate anaemia. The red cells were 3,000,000, the white cells 8,000 per cubic millimetre. The haemoglobin was 72 per cent. and there was an eosinophilia of 7·06 per cent. The filaria embryos were markedly diurnal in the blood, rising from 5 at midnight to 531 at noon in measured equal drops of blood. Three cases of *Filaria bancrofti* briefly noted by the authors present little of novelty. Two were Porto Ricans.

Two useful notes upon technique are given. It was found possible to secure a concentration of the parasites in small areas by mixing two large drops of blood on a slide with one drop of sodium citrate 1 per cent. The mixture was then drawn out in a thick film over a restricted part of the slide, enclosed in a Petri dish with moist filter paper on the bottom and left in the incubator at body temperature for half an hour. The blood slowly clots and shrinks. In the clear citrated serum many of the embryos are found. In cases where the embryos in the blood are very few or apparently absent they may be detected by collecting 0·1 to 1 cc. of blood into 5 cc. of a two per cent. acetic acid solution. The mixture is gently shaken and then centrifuged. The embryos are found in the sediment.

The writers believe that the explanation of the periodical appearance of filarial embryos in the peripheral blood stream "will be found to rest in some form of mechanical operation." They maintain that "the period of their special discovery in the skin corresponds not with a period of relaxation of the capillaries, but rather with a period of contraction (and therefore of retention)." Experiments on the transmission of *Filaria bancrofti* by *Cimex lectularius* showed that the embryo invaded the tissues but did not undergo metamorphosis.

R. T. L.

Johnson (F. B.). **Filarial Infection.—An Investigation of its Prevalence in Charleston, S. C.**—*Southern Med. Jl.* 1915. July. Vol. 8. No. 7. pp. 630–634.

Of 400 individuals in the city of Charleston, S. C., 19·25 per cent. were found to harbour filaria embryos in the blood. In the majority of cases no symptoms are produced by the worms. Five per cent. of the cases showed symptoms of filariasis. The white race showed a higher percentage (23 per cent.) than the coloured (18 per cent.). The white females gave 28 per cent. of 50 cases examined.

R. T. L.

Morlot & Zuber. **Néosalvarsan et *Filaria loa*.**—*C. R. Soc. Biol.* 1914. July 31. Vol. 77. No. 27. pp. 475–476.

A patient who suffered from syphiliphobia exhibited manifestations of the presence of *Filaria loa* every ten to fifteen days, especially in the eyes. During two months ten intravenous injections of neosalvarsan were given commencing with the minimum dose of 15 centigrammes and increasing each by 15 centigrammes. The last four injections were each of 90 centigrammes. The filaria completely disappeared and has not been seen during the last three months. Six weeks have now elapsed since the last injection.

R. T. L.

Pinto da Rocha (Americo). **Un Caso de Filaria ocular.**—*Med. Contemporanea.* 1914. Nov. 29. Vol. 32. No. 48. pp. 379–380.

A female *Filaria loa* was extracted in May 1914 at the Hospital Militar da Estrella from the eye of a Portuguese who had been in Angola and the Congo between 1908 and 1912. The worm measured 25·5 mm. in length and was 450μ in breadth. The blood showed an eosinophilia of 14·4 per cent. Calabar swellings were noted in the course of the infection.

R. T. L.

Nicoll (William). **On the Migration of the Larvae of *Onchocerca gibsoni* through the Capsule of the Worm Nodule.**—*Ann. Trop. Med. & Parasit.* 1914. Dec. 15. Vol. 8. No. 3. pp. 609–621.

Breinl had recently stated that the Onchocerca larvae could make their escape from the worm nodules and reach the exterior by piercing the skin. The author endeavoured to confirm these conclusions but without success. Larvae were never observed either in the water used, in the bandage applied or in scrapings of the skin over the nodules. It is however concluded that these observations do not vitiate the validity of Breinl's results. By placing freshly excised nodules in water it was ascertained that larvae migrated through the undamaged capsules into the water, usually in small numbers but occasionally in comparatively large numbers. [Breinl's positive results may have been due to contamination with freeliving nematodes. The author overlooks the recent records of the detection of Onchocerca larvae in the blood in human infections.]

R. T. L.

McConnell (R. E.). **Dracontiasis or Dracunculosis: A Review.**—*Jl. Trop. Med. & Hyg.* 1914. Nov. 16. Vol. 17. No. 22. pp. 337–340.

Mignacca (Pietro). **Filaria di Medina.**—*Studi di Med. Trop., Collezione di Pubblicazioni Scientifiche sull'Eritrea.* 1914. Vol. 1. pp. 149–153.

These papers contain no original matter. The chief facts known concerning the structure, transmission and pathological effects caused by the Guineaworm are summarised from the most accessible text books. McConnell refers briefly to a case in a European who was

infected apparently in the White Nile Province of the Sudan. [The occurrence of Guineaworm especially on the backs of Indian water carriers is again quoted, although there are good grounds for doubting the original observation. The statement has been repeatedly questioned and it would be useful if some Indian observers would make new inquiries on this subject.]

R. T. L.

Mukerji (J. G.) & Dass (Banarsi). **Prevalence of Intestinal Parasites in the United Provinces.**—*Indian Med. Gaz.* 1915. June. Vol. 50. No. 6. pp. 205–206.

The stools of six hundred patients attending the King George's Hospital, Lucknow, were examined microscopically for evidence of parasites. A good number were taken indiscriminately but the others were selected as showing suspicion of a positive result. Forty per cent. were found to harbour intestinal parasites and of these nearly 27 per cent. were intestinal worms. There were 96 cases of ankylostome infection, 29 of *Ascaris lumbricoides*, 12 of *Trichocephalus trichiuris*, 18 of Tapeworm and 2 of *Oxyuris vermicularis*. The tapeworm records are based upon the ova, which were almost certainly those of *Taenia saginata*. A single specimen of a Strongyloides embryo was found once only in a Mohammedan.

R. T. L.

Fischer (Walter). **Ueber Stuhluntersuchungen bei Europäern und Chinesen in Shanghai.** [Results of Examination of Faeces in Shanghai.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Sept. Vol. 18. No. 18. pp. 615–634.

A systematic examination of the faeces of 202 persons at the *Deutsche Medicinschule für Chinesen* in Shanghai gave the following results :—

A. Healthy and sick Chinamen.

108 cases.

Ascaris	21
Trichocephalus	28
Oxyuris	1
Ankylostomes	4
Clonorchis sinensis ..	4
Strongyloides	2
Taenia saginata	1
Schistosoma japonica ..	1

B. Healthy and sick Europeans (three-fourths suffered from intestinal symptoms).

194 cases.

Ascaris	12
Trichocephalus	48
Ankylostomes	3
Clonorchis sinensis ..	3 (all half-castes).
Strongyloides	0
Schistosoma japonicum ..	0
Taenia saginata	Some cases.
Dibothriocephalus latus ..	1 (infected in Finland [?]).

R. T. L.

McNeil (H. L.). **Fifty Cases of Intestinal Parasites in Adults, with an Attempt to study some Symptoms caused by them.**—*Southern Med. Jl.* 1915. June. Vol. 8. No. 6. pp. 486–493.

The author has been impressed by the following facts in the course of an inquiry made at the Southern Pacific Hospital, Houston, Texas :

"First: Indefinite and unexplained abdominal pains or tenderness should make one suspicious of intestinal parasites. Parasites should be suspected in all cases of 'chronic or subacute appendicitis.'

"Second : The adult negro is practically immune to hookworm infection, apparently, in this part of the country.

"Third: Many apparently normal men, who harbor parasites, are subject to certain indefinite complaints, diagnosed usually as 'indigestion,' 'cramps,' 'biliousness,' 'mild diarrhoea,' 'malaria,' 'febricula,' 'grip,' etc., which are really symptoms of the parasitic infections.

"Fourth: An otherwise unexplained eosinophilia is good evidence of parasitic infection, even though the parasites are not discovered at the first stool examinations, but an absence of eosinophilia does not rule out parasitic infection."

Table showing Distribution of Symptoms according to Infection.

	No. of cases.	Eosinophilia (over 4%)	Anaemia (marked).	History of Colics.	Abdominal tenderness.	Fever.	Chills.	Indigestion.	Diarrhoea.
Hookworm	19	18	9	6	4	5	2	3	2
Taenia nana..	6	5	1	6	4	1	1	3	0
T. saginata	4	3	0	2	1	0	0	0	0
Pin worm	3	1	0	2	1	0	0	1	0
Whip worm	4	0	0	2	3	1	0	1	0
Strongyloides	2	2	1	0	2	0	0	0	2
Lamblia	2	0	0	0	2	0	0	0	2
Amoeba hyst...	16	0	0	0	12	4	0	0	13
Taenia solium	1	1	0	1	1	1	1	0	0
Cercomonas	4	0	0	0	0	0	0	0	2
Amoeba coli	58	0	0	0	0	0	0	5	4
Mixed (whip worm, pin worm, and *Hymenolepis nana*)	1	1	0	1	1	1	0	1	1
Mixed (hookworm and *Hymenolepis nana*)	1	1	1	1	1	0	0	1	0
Mixed (*Amoeba coli* and *Amoeba hyst*,).	4	0	0	0	4	1	0	0	4

In the reply to the discussion on the paper. Dr. McNeil states that nervous symptoms did not figure largely, probably because most of the patients were adults.

R. T. L.

EYTINGE (E. O. J.). **Case Reports from Guam,**—*U. S. Naval Med. Bull.* 1914. Jan. Vol. 8. No. 1. pp. 116–123. With 2 plates.

Two of the cases reported are of interest to readers of this journal :—

Pseudo-fibroid of uterus.—A Chamorro multipara, aged 42, was admitted to the Naval Hospital. There was a steady drip of blood from the cervix. On bimanual examination a mass the size of a child's head was found, springing from the fundus, hard, nodular, and moving with the uterus. A diagnosis of fibroid was made. There was the "regular round, whip, and hookworm infection met with in Guam." The bleeding diminished with rest in bed and on the following day the patient was curetted. A week later there was no change in the tumour. "A vigorous course of thymol and santonin was begun. Some hundreds of round worms were passed and coincidently the tumour disappeared, apparently having been a mass of round worms." The patient was discharged well.

A Fatal Case of Ankylostomiasis.—A Chamorro girl, aged 3, was admitted on November 4. The child had been ill for a long time with weakness and general swelling of the body. On admission there were general oedema and anasarca. The complexion was waxy. The stools showed a round, whip and hookworm infection. Blood examination—haemoglobin 25 per cent., red cells 1,070,000, white cells 11,000. Treatment with santonin and thymol was begun and pushed. Repeated doses of thymol as large as 2 drachms failed. The patient grew steadily worse and died on December 20th. The post mortem showed a typical picture of profound anaemia. "The upper part of the small gut was alive with hookworms, the entire wall being lined with them. . . . Thymol failed utterly."

A. G. B.

MATSUOKA (Y.). **On the Question of the Pathological Meaning of the Worms in the Vermiform Appendix.**—*Sei-i-Kwai Med. Jl.* 1915. Jan. 10. Vol. 34. No. 1. Whole No. 395. pp. 2–3. (The Original in No. 23. Vol. 28 of the *Jl. Tokyo Med. Assoc.*)

The author has endeavoured to determine whether the worms frequently present in the appendix are the cause of inflammation of this organ and if they can produce other tissue changes. Out of 103 appendices removed by operation 48 contained parasites or their eggs. In 29 (28·27 per cent.) these were oxyuris and in two the trichocephalus was present. In 33 cases of acute appendicitis oxyuris occurred three times while on 26 occasions this parasite was found in normal or not acutely inflammed appendices. In forty-five of the cases the appendix was quite normal and there was no sign of inflammation, although parasites were present in 25 instances and the diagnosis of appendicitis had been arrived at on clinical grounds. In 91·7 per cent. of those cases sent from the surgical clinic parasites were present. The author concludes that these helminths do not cause appendicitis although they induce symptoms which may be named *appendicopathia parasitaria* and are characterised by absence of fever and pain on pressure over the ileo-caecal region.

R. T. L.

Emrys-Roberts (E.) & Stephens (J. W. W.). **Banana Débris in Faeces simulating Tapeworn Segments.**—*Jl. Path. & Bact.* 1915. Apr. Vol. 19. No. 4. pp. 486–487. With 1 plate.

From the washings of the rectum in a case of inoperable carcinoma a number of minute black bodies were obtained. These under the microscope showed a segmentation recalling that of the tapeworms. Their vegetable nature was established by the recognition in an isolated portion of two parallel rows of segments with an intermediary spiral fibre to which the rows were intimately connected by a stroma of cells. Cammidge had previously figured banana debris as spurious *Hymenolepis nana*. When bananas were excluded from the dietary in the present case the passage of these curious bodies ceased.

R. T. L.

Burge (W. E.) & Burge (E. L.). **The Protection of Parasites in the Digestive Tract against the Action of the Digestive Enzymes.**—*Jl. Parasit.* 1915. June. Vol. 1. No. 4. pp. 179–183. With 3 text-figs.

From experiments on the tapeworms (*Taenia serrata*) and roundworms of the dog it was ascertained that these parasites are not digested when introduced into activated pancreatic juice so long as they remain alive, but are digested when dead. If any part be killed it is digested. By a series of ingenious experiments it was shown that by keeping the dead body of a roundworm constantly permeated with nascent oxygen it can be introduced into activated pancreatic juice without risk of digestion. The author concludes that the oxidative processes of the living parasites oxidise the enzyme solution in immediate contact with them and so enable the organisms to withstand the action of the digestive juices.

R. T. L.

Paulian (Démètre Em.). **Parasitisme et Eosinophilie.**—*C. R. Soc. Biol.* 1915. Apr. 30. Vol. 78. No. 7. pp. 155–156.

From experiments made upon guinea-pigs by injecting them with toxins derived from *Taenia cucumerina* [*Dipylidum caninum*], *Ascaris megalocephala*, *Oxyuris vermicularis* and *Trichocephalus dispar* the author concludes that these toxins sensitise the animal organism and the anaphylaxis causes the aapperance of the eosinophile cells which defend the body against these toxins in the same way as the polynuclear cells protect it against microbes. The animals experimented upon reacted in the following manner : Their weight fell quickly in five days from 200 to 100 grams. The temperature rose immediately. The leucocytic formula was also affected. The number of polynuclear leucocytes rose in the first days, varying between 55 per cent. and 78 per cent., then fell to about 12 per cent. At the same time the mononuclear cells increased from 30 per cent. to 70 per cent. The lymphocytes also rose and an intense eosinophilia followed, rising from 2 per cent. to 44 per cent. and reaching its maximum on the third and fourth day after the injection, thereafter decreasing again. The daily injection was uniformly 3 cc.

R. T. L.

Orme (William Bryce). **Beta-Naphthol Poisoning occurring during the Treatment of Ankylostomiasis.**—*Brit. Med. Jl.* 1915. July 31. pp. 176–177.

The clinical features of a fatal case of Beta-naphthol poisoning are recorded and it is mentioned that two other cases have come under the author's notice. The patient received 30 grains of Beta-naphthol at 7 a.m., at 9 a.m. and at 11 a.m. on August 29th. On the following day the treatment was repeated. On August 31st, a first dose was administered at 7 a.m. Vomiting began shortly afterwards. At 6 p.m. the patient's temperature was 102·8° F. On the following morning vomiting continued. The urine was extremely dark and a slight jaundice appeared. The patient was much collapsed and died in the early hours of the next day. A sample of urine removed after death was highly albuminous and very dark. Before treatment the urine had been found to be acid with a specific gravity of 1,010 and cloud of albumin. The author concludes that in patients suffering from diseases of the kidneys Beta-naphthol should be used with the utmost caution, if at all.

R. T. L.

FEVERS IN THE TROPICS AND DENGUE.

Beverley (E. P.) & Lynn (W. J.). **The Reappearance of Dengue on the Isthmus of Panama.**—*Proc. Med. Assoc. Isthmian Canal Zone, Oct., 1912 to Mar., 1913.* Vol. 5. Part 2. pp. 32–42. With 2 charts.

An epidemic of 60 cases of a short duration fever diagnosed as dengue is described and full reports of four cases are given. The chief characteristics of this outbreak were, sudden onset of a pyrexia lasting three to eight days and severe frontal headache with aches in the limbs and back, apparently felt in the bones; the most typical pains had their seat in the knee joints; these were increased on walking, with at times excruciating pains in the back. The initial erythematous rash is associated with photophobia and injected conjunctivae, when the appearance is like that of a mild case of yellow fever. Glandular enlargements were common and the terminal eruption was found on the third to the fifth day in 60 per cent. of the cases. Convalescence was always very slow, and there were no complications. The chief interest lies in the differentiation from influenza, articular rheumatism, and malaria. The diagnosis was confirmed by a board appointed by the chief Sanitary Officer. In the discussion which followed, the fact that the disease had been so limited, in contradistinction to the usual rapid diffusion of epidemic dengue, was thought by some to throw a doubt on the diagnosis.

P. W. Bassett-Smith.

Deeks (W. E.). **Case Reports on Six-Day Fever.**—*Proc. Med. Assoc. Isthmian Canal Zone, Oct., 1912 to Mar., 1913.* Vol. 5. Pt. 2. pp. 43–44.

This is a short note in which the author draws attention to the fact that in this fever the rash is more common than he at first reported. It follows the fall of the temperature, is petechial in character, confined to the extremities and is generally noticed on the sixth day fading away in one or two days. The cases differed from those described by Beverley [see above] by the persistence and exact limitation of the fever, the differential blood count with marked leucopenia, and the enlargement of the spleen.

P. W. B-S.

Breinl (A.), Priestley (H.) & Fielding (J. W.). **On the Occurrence and Pathology of Endemic Glandular Fever, a Specific Fever occurring in the Mossman District of North Queensland.**—*Med. Jl. of Australia.* 1914. Oct. 24. Vol. 1. No. 17. pp. 391–395. With 4 charts.

In 1910 Smithson called attention to this disease, which he called Mossman fever and in 1913 Clarke described it more fully. Endemic glandular fever is defined as "an acute disease characterised by an irregular remittent fever of from three days to three weeks duration, accompanied by painless swellings of certain groups of superficial lymph glands, and by the appearance of a macular, or occasionally

vesicular, rash." The disease at different times has been confounded with filariasis and plague, though the mortality is practically nil. It affects both natives and whites of all ages in the endemic region. The incubation period is about six days, sometimes as long as ten. The onset may be sudden or gradual, the high fever lasting from three to ten days, when the temperature falls by lysis. The pulse is usually soft, of low tension and often dicrotic; headache is always present and bone pains are common. The axillary and inguinal glands are the ones generally affected; they are painful but never suppurate; as the fever passes off, the glands decrease in size rapidly but may at times persist for months. All the cases observed by the authors showed a well-marked rash at the commencement of the pyrexia, on the trunk, arms, and legs, occasionally on the face, persisting for two to four days, either macular or vesicular in character. Sweats and constipation are commonly noticed; relapses may occur. Three types are described, restless, drowsy, and chronic; 92 per cent. of the cases belong to the former type. In the second the appearance resembles that of typhoid; the drowsiness may deepen into coma and the patient die. One attack is said to give slight immunity; the mortality is less than 1 per cent. No definite etiological facts have been made out but the disease appears to be transmissible to monkeys by means of the peripheral blood (2 cases).

Though the disease is endemic in certain areas it is not contagious, for it does not spread in the wards of a hospital; it would however appear that those employed in manual labour are most frequently attacked. In the conclusions the authors state that the disease is in all probability transmitted by insects, but no proof is given and no parasites have been found in the peripheral blood.

P. W. B-S.

Suhr (A. C. H.). **A Note on Fevers resembling Sand-fly Fever at Singapore.**—*Jl. Royal Army Med. Corps.* 1915. Jan. Vol. 24. No. 1. pp. 49–51.

Shortly after his arrival at Singapore the author was impressed by the number of short fevers that simulated the phlebotomus fever of Malta; as however short fevers are frequently due to light malarial infections, the diagnosis is difficult. He had the opportunity of observing carefully a draft of men who arrived from home in 1912 and had never had malaria. He divides the fever cases among them into (1) Typical malaria with parasites; (2) Clinically malaria, but no parasites; (3) Cases probably of sand-fly fever with all the symptoms as recognised in Malta. Most of the latter were contracted at Pulan Brani which is almost free of malaria. Many small flies were caught for examination but so far not one has proved to be a phlebotomus.

P. W. B-S.

Kersten (H. E.). **Die pockenverdächtigen Erkrankungen in Rabaul im Februar 1914.** [A Doubtful Case of Small Pox in Rabaul [New Pomerania].]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1914. Oct. Vol. 18. No. 20. pp. 691–697. With 1 text-fig. & 4 curves.

A native who had been employed unloading a ship from Sydney developed a febrile disease with a pustular eruption very like that of

smallpox, which was later followed by a second darker eruption leaving no scars. Three other cases suffered from vesicular eruptions about the same time. To clear up the diagnosis each case was inoculated with animal lymph in one arm and human lymph in the other. In the first case the results were entirely negative; the others showed well marked vaccinia vesicles, the results pointing to the first being smallpox and the others varicella. The author thinks that the first case had a double infection of (1) the disease derived from Sydney, which owing to its slight contagiousness and low mortality (2 per cent.) he believes not to be true variola but a disease *sui generis*, and (2) Chicken pox similar to the other three men.

P. W. B-S.

Dowden (R.). **A Suspected Case of Kedani River Fever in the Federated Malay States.**—*Indian Med. Gaz.* 1915. June. Vol. 50. No. 6. pp. 208–211.

In 1910 Sandwith noted that this fever was restricted to Japan. Lately Schüffner from 150 cases describes a similar disease in Deli, Sumatra, under the name of Pseudo-typhus [see this *Bulletin*, Vol. 5, p. 360], and Ashburn and Craig recognised it in the Philippines. The author describes a case in detail from the Malay States. The patient was a European aged 20, who had lived there for over two years with good health except for slight attacks of malaria. After being ill for fourteen days he was admitted to hospital, when his appearance was like that of a typhoid in the third week. The rash came out on the eighth day, it was profuse and became haemorrhagic, and was accompanied with some glandular swelling and neuralgia. On the twentieth day a rash like that of a secondary syphilide appeared which lasted forty-eight hours. The case was complicated by pneumonia and a gluteal abscess following a quinine injection. Only symptomatic treatment was used and after the disease had lasted a month recovery set in. Most of the symptoms were like those of the Deli cases, but the blood picture showed no marked alteration. No etiological information is given.

[Weir, H. H., describes a similar disease in Korea, this *Bulletin*, Vol. 5, p. 361].

P. W. B-S.

Noc & Gautron. **Deux cas de fièvre indéterminée rappelant le pseudo-typhus de Delhi observés à Saigon.**—*Bull. Soc. Med. Chirurg. Indochine.* 1915. Feb. Vol. 6. No. 3. 8 pp.

In the autumn of 1914 the authors observed two cases of obscure fever in Europeans at the Military Hospital, Saigon. The fever was accompanied by a roseolous eruption on the body and limbs, a superficial small area of necrosis of skin, enlarged glands, pulmonary congestion, and marked nervous symptoms. The cases were very similar to those seen by Schüffner at Deli [this *Bulletin*, Vol. 5, p. 360] and like them failed to give any serum reactions for typhoid and para-typhoid. A similar disease has been observed in the Philippines and Japan but no cases have been recorded previously from Cochin China or Cambodia. One of the cases was fatal; though an autopsy was made it did not give any important information.

The second recovered; the temperature curve was like that of typhus, falling by lysis to normal about the 14th day. The eruption on the face is always absent or scanty, blood cultures are negative, and there is an early polynuclear increase with a lymphocytosis later; eosinophiles are absent. The cases show many points of resemblance to the pseudo-typhus of Deli and the "River Fever" of Japan, yet differ only so slightly from true typhus that the authors are not able definitely to classify them.

P. W. B-S.

Crohn (B. B.). **Rat-Bite Fever.**—*Arch. Intern. Med.* 1915. June 15. Vol. 15. No. 6. pp. 1014–1039. With 1 chart.

Very little is known of this uncommon disease. The author has provided a most excellent and complete resumé of all the reported cases, to which he adds a full description of one of his own. The disease has been observed in Japan, America, Great Britain, France, and Italy but not in the German Empire. Agriculturists and sailors have been most frequently affected. The disease occurs at any age, but generally in adults. The bite is nearly always described as caused by a large brown or black rat, never by tame white rats; little is known as to the condition of the animal which has caused the lesion as the original bite generally heals up at once. The wound has been in the face and head or upper extremity in 47 out of the 52 cases. The incubative period averages twelve days; this is followed by chills, fever, induration, and discolouration of the wound, and lymphatic inflammation. After one or two days there is a bluish red rash which lasts as long as the fever, nervous symptoms are marked, and nephritis is a common complication. The paroxysm lasts about four days. There may be only one attack or as many as twenty recurrences, usually about ten. A slow convalescence is generally made, but fulminating cases fatal in a few days have been described, death then being due to nephritis. The mortality rate of the 52 cases was 10 per cent. As to the nature of the cause of the disease we are still in the dark; no parasitic bodies have ever been found in the blood except by Ogata, whose observations are not yet confirmed. There are many points which favour a spirochaete infection similar to that of relapsing fever; it may be noted that salvarsan when used acted favourably and Proescher and Ogata were able to infect successive generations of guinea-pigs. Another theory is that the symptoms are the result of a powerful neuro-toxin locally created; a case of Bankers favours this view, as in this patient there was permanent atrophy and paralysis of the arm following a bite on the hand of the same side. The original paper should be read by all interested in the subject.

P. W. B-S.

Chagas (Carlos). **Verificão no Rio de Janeiro da molestia Sokodú (Rattenbisskrankheit) devida á mordedura de rato.** [Occurrence in Rio de Janeiro of a Case of Rat-Bite Disease.]—*Brazil Med.* 1915. July 22. Vol. 29. No. 28. pp. 217–220.

A report of a typical case of rat-bite disease in a boy aged 10 years, being the first to be recognised in Brazil. The patient was still under

observation at the time of writing. The greater part of the paper is occupied by a systematic account of the disease, and its treatment with neo-salvarsan, such as will be found in most of the text-books.

J. B. Nias.

Perugia (A.) & Carchidio (U.). **Le Malattie da Morso di Topo (Sokodu-Rattenbisskrankheit).** [Rat-bite Fever].—*Riforma Medica.* 1915. Feb. 27. Vol. 30. No. 9. pp. 229–232; Mar. 6. No. 10. pp. 256–260.

An account of a case of rat-bite fever, being one of the first to be recognized in Italy.

The patient was a male, aged 54, who was bitten on the index finger of the right hand by a rat on the 1st of May 1914. The bite appears to have been trifling and to have healed quickly. After an interval of ten days, tenderness and throbbing were felt at the seat of the injury and a small vesicle appeared filled with bloody serum. Symptoms of general malaise quickly followed, with engorgement of the lymphatics of the right arm and a high temperature, and on the 3rd June the patient took to his bed. The finger was then found to be generally inflamed, without any trace of fluctuation, the skin being yellow in tint with small areas of desquamation. The pain was not so severe as might have been expected. The fever continued to present an intermittent character until the 18th of July, i.e., for nearly seven weeks, and then began to subside, and from the 1st to the 6th of August the patient appeared to have entered upon the stage of convalescence. On the 7th of August, however, all the symptoms reappeared with increased severity and were this time accompanied by albuminuria with swelling of the legs and pain in the bones and joints. This second phase of the illness lasted until November 4th when recovery was complete. Treatment was initiated with quinine, salicylic acid, arsenic and atoxyl without any benefit. Finally, on a date not stated, an injection of 30 centigrammes of neosalvarsan was given into the muscles of the buttock, and this produced improvement. A second injection of neosalvarsan was then given endovenously [date and amount not stated], which promptly terminated all the symptoms. A considerable number of estimations of the eosinophiles in the blood were made in the course of the illness, with results that are stated in the text.

Those who are specially interested in the subject of rat-bite fever would do well to consult this paper, as it gives a very fair account of the bibliography of the subject.

J. B. N.

PAPPATACI FEVER.

Birt (C.). **Phlebotomus or Sandfly Fever.**—*Brit. Med. Jl.* 1915. July 31. pp. 168–169.

The author deals with the subject in his usual masterly manner. After a short description of the symptoms of the disease he shows that the susceptibility of British troops is very high and gives figures to show that the duration of the fever is rather longer in India than in Malta; in the former it lasts for six days in 20 per cent. of cases whereas in Malta the percentage is only 9. Ninety-five per cent. of all cases occur in people who have resided two years or less in the endemic area, and a high degree of immunity is afforded by the fever. In malarial climates it was and still is often confounded with malaria, but though the onset may be attended by a chill there is never the severe rigor experienced in malaria. He states that since five or six thousand attacks of sandfly fever occur annually among the European and Indian troops the amount of quinine which has uselessly been expended is enormous. He quotes a memorandum issued in 1913 in India in which very thorough instructions are given for the examination of all cases of fever to differentiate the various forms; this method might with advantage be carried out elsewhere. He gives figures showing the increase of admissions for this fever in India due to better diagnosis. In 1910 there were 512, in 1912 it had risen to 2,163 among 71,000 European troops. There is a close correlation between the number of sandflies and the fever; in Poona the flies are scarce and cases are few, in N.W. India they are abundant and the fever is prevalent. Since the knowledge of the disease has been acquired the incidence of the fever in Malta among the British troops has been reduced from over 300 in 1908 to 104 in 1912. This improvement is largely due to Col. Birt's own labours.

P. W. Bassett-Smith.

Houston (J. W.). **Sandfly Fever in Peshawar.**—*Brit. Med. Jl.* 1915. July 31. pp. 170–172.

In the Peshawar district sandfly fever has been long known to be endemic. The author shows that newly arrived forces suffer twice as much as those who have been on the station for some time and that the infection appears to cling to certain bungalows and barracks, the maximum incidence being in May and June. Both *P. papatasii* and *P. minutus* are found; the former is however the most common, the relative proportion being 20 to 1.

Besides the ordinary three day fever a second longer type, resembling the seven day fever of the coast towns, occurs in the summer months and is attributed by some to the presence of sandflies.

In this the symptoms are less severe and a rash is sometimes seen; it differs from dengue in being more sporadic in appearance and much less epidemic in character, and by the mildness of the symptoms. It is noted that Stegomyia are present and may possibly be carriers of this type of fever.

P. W. B-S.

Graham (G. F.). **Sandfly Fever in Chitral (N. India).**—*Brit. Med. Jl.* 1915. July 31. pp. 169–170.

During 1911–1913 the author made observations on 700–800 cases of this fever in Chitral. The disease was first described by McCarrison in 1906 as "three day fever," but it has long been known in other parts of India by local names. This fever is prevalent in the whole of the Peshawar Chitral Valley up to 7,000 feet; above that level the sandfly cannot live and breed. It is limited to the summer months between May and September, and a very dry season appeared to be most favourable to its spread. The most favourable temperature for the imago to hatch out is 70° to 80° F. In Chitral, Europeans and Gurkhas suffer most (60 to 80 per cent.); the troops that have lived previously in the plains of the Punjab being almost immune. For diagnosis the relatively slow pulse and leucopenia are important signs. The author emphasises the fact that, though the disease causes a very distressing type of fever for two or three days, out of his 700 cases he has not noticed any lasting ill effects; recovery is absolute, and a marked immunity is given by one attack.

P. W. B-S.

Gabbi (U.). **Ueber den Werdegang des Auftretens und der Verbreitung des dreitägigen Fiebers in Ostsizilien sowie in Unterkalabrien.** [The Mode of Origin and Spread of Three Day Fever in East Sicily and Lower Calabria.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. May. Vol. 19. No. 6. pp. 160–170.

The author has already written much on the subject in various journals which have been reviewed; in this paper he restates his observations and conclusions. He attributes the introduction of the fever into Sicily and southern Italy to the large quantities of wood brought from Herzegovina, Dalmatia and Istria in order to build temporary dwellings for the inhabitants after the earthquakes. He assumes that either the phlebotomus or its larva containing the disease germ were conveyed in the wood and, as the duration of the voyage is only from 50 hours to 9 days, it was quite possible for the flies to survive and carry the infection, which when once introduced is quickly spread if breeding places for the phlebotomus are present.

An active crusade against the insect would rapidly eliminate the disease.

P. W. B-S.

Pellegrino (P. L.). **Su la febbre da pappataci o febbre dei tre giorni. Definizione, Etiologia, Patogenesi, Profilassi.**—*Malaria e Malat d. Paesi Caldi.* 1915. May-June. Vol. 6. No. 3. pp. 143–155.

The author gives an historical survey of our knowledge of three day fever, or as he prefers to call it "Febbre da pappataci" a name which definitely associates the disease with the fly known to carry the infection, and distinguishes it from dengue which is "una febbre da culex." He draws attention to the danger of the ambulant forms and to the protection given by previous attacks. Meteorological conditions undoubtedly to a certain extent determine the amount of prevalence

of the disease in endemic areas, as is found in other insect carried infections. Spraying buildings with formalin may kill off the flies, and rubbing the body with ointments containing boric acid, zinc, oil of eucalyptus, and oil of verbena may have a certain protective influence, but the only reliable prophylactic measure is to destroy the breeding places of the flies.

P. W. B-S.

Giugni (Francesco). **La febbre dei tre giorni o febbre da pappataci.**—*Riv. Crit. di Clin. Med.* 1915. Feb. 20. Vol. 16. No. 8. pp. 120–125.

The history, etiology, course, and treatment of "three day" or "pappataci fever" are given very fully, but no new facts are recorded. Clinically three variants from the typical fever are described: (1) An apyretic type with the symptoms but no fever. (2) An attenuated or abortive type in which the duration is short and the symptoms slight. (3) A prolonged type; this is rare in the Mediterranean, more common in India. For prevention of epidemics the author concurs in Prof. Gabbi's views.

P. W. B-S.

Marett (P. J.). **The Bionomics of the Maltese Phlebotomi.**—*Brit. Med. Jl.* 1915. July 31. pp. 172–173.

The Maltese phlebotomus requires for its development some warm, dark, rather damp, quiet position, the interstices of walls and crevices in caves and old buildings being their favourite haunts, and the most favourable temperature is about 70° F.; below 60° the larvae roll up; if the air is too dry they shrivel. The larvae are however difficult to find as they bury themselves in the excrement of wood lice, etc., on which they feed. Three species have been described from Malta by Newstead, *P. papatasii*, *P. minutus*, *P. perniciosus*. They commonly appear in May, are most numerous during August, and disappear in December or early January; during the first four months of the year only larvae are found as the fly is stated not to hibernate. A table is given setting out the length of life of the different stages, for both the wild and tame (laboratory reared) flies. Four generations of the latter were bred out from the middle of August to the end of March. When the larvae is about to pass into a pupa, if the detritus in which it lives is not too dry, it comes to the surface; if it is dry the fly on leaving the pupa has to work its way to the surface. It is sexually mature within a few hours after emerging, the females only sucking blood which they generally do before pairing. After about seven days the wild fly lays its eggs and then dies, tame flies may live much longer (25 days). The flies are nocturnal, dislike sunlight, but are attracted by artificial light; as they do not fly high they are rarely found in upper rooms. A mite which hatches out in the wood louse excreta is found as a common ecto-parasite and does not appear to be harmful but a minute pseudo-scorpion injures the larvae. The author gives a short description of a fungus, *Empusa papatasii*, which is pathogenic to the fly, and may possibly produce symptoms of diarrhoea in children bitten by the diseased flies.

P. W. B-S.

VERRUGA PERUVIANA AND OROYA FEVER.

Strong (R. P.), Tyzzer (E. E.) & Sellards (A. W.). **Differential Diagnosis of Verruga Peruviana. (Fifth Report). From the Harvard School of Tropical Medicine, Boston.**—*Jl. Trop. Med. & Hyg.* 1915. June 1. Vol. 18. No. 11. pp. 122–125.

The points differentiating verruga from framboesia, syphilis, and Oroya fever are very clearly put forward. It is stated that the unity of the two diseases, Oroya fever and verruga, is still held by some in the endemic area, chiefly on the old record of Carrion's experiment. The authors obtained a volunteer who was inoculated with verruga lesions from two cases. This caused none of the blood changes constantly found in Oroya fever but produced a local infection of verruga after a period of sixteen days. Part of the lesion removed from the case was inoculated into the testis of a rabbit and this animal gave typical results of verruga in twenty-five days ; the other part was subjected to histological examination, and a section was found to be similar to other human verrugas that had been examined. This experiment proved that direct inoculation of verruga from man to man does not cause Oroya fever but a modified verruga infection, analogous to the results found in smallpox inoculations. The disease is differentiated from yaws very definitely by the absence of spirochaetes in the lesion and by the results of treatment with salvarsan, as well as by the histological structure of the external evidences. The relationship of verruga to Bassewitz's disease* found in Brazil is still under consideration, but undoubtedly they are very closely related.

P. W. Bassett-Smith.

Strong (R. P.) & Tyzzer (E. E.). **Pathology of Verruga Peruviana. (Sixth Report) from the Harvard School of Tropical Medicine.**—*Amer. Jl. of Trop. Dis. & Prevent. Med.* 1915. Apr. Vol. 2. No. 10. pp. 615–626.

Following up the previous work the authors now describe minutely the histo-pathological characters of the verruga lesions found by them and by previous workers. They first point out that the belief usually held that internal lesions are common is not correct, and that these statements have been due to errors in diagnosis caused generally by tubercular disease occurring concurrently with verruga or alone. Recently da Rocha Lima and Cole have carefully examined and described the verruga nodules in man and animals, but the authors believe that these observers have been led into errors by drawing conclusions from data supplied by a study of an insufficient number of cases. "The verruga nodule constitutes a special form of granuloma characterised in the early stages by the formation of new blood vessels in oedematous connective tissue, and by marked proliferation of the angio-blastic cells forming masses or islands of closely placed cells ; by the invasion of the connective tissue by

* "Angiofibroma cutis circumscriptum contagiosum," described with a photograph in *Archiv. f. Schiffs.-u. Trop.-Hyg.*, 1906, Vol. 10, pp. 201–219. A short description is given in Castellani & Chalmer's Manual.

lymphocytes, plasma cells, and leucocytes, and as the lesion progresses by the formation of fibro-blasts and the deposit of collagen fibrils." In different tumours the appearance may resemble that of a fibro-sarcoma, myxo-sarcoma, or an angioma. No giant cells were found and no protozoal or other micro-organisms could be detected in unbroken nodules. Bassewitz's "Angiofibroma cutis circumscriptum contagiosum," if not identical with verruga peruviana, is a very closely allied disease, but further observations are required.

P. W. B-S.

Townsend (C. H. T.). **Progress of Verruga Work with *Phlebotomus verrucarum*, T.**—*Jl. Econom. Entomol.* 1914. Oct. Vol. 7. No. 5. pp. 357–367.

In continuation of previous experiments on the transmission of verruga and Oroya fever by a species of phlebotomus found in the verruga zone and called by him *P. verrucarum*, the author describes a series of experiments with monkeys, dogs, rabbits and guinea-pigs, which were either subjected to the bites of living flies, or injected with emulsions of their macerated bodies. His views as to the duality of the two diseases are in direct opposition to those of Strong, and the experiments appear to be without efficient controls. It is notable that he obtained 100 per cent. positive findings of Bartonia bodies in the animals treated, but, as he states, a prolonged search, taking from a few hours to whole days, might be necessary to find a single body and these are only present during the first three days. In the case of several animals in which nodules were not produced, the conclusion is given that they have small susceptibility and that the organisms were phagocyted, but no proof of this is given. The conditions produced in some cases were due to other infections, for one dog developed an enormous abscess. Though the author has devoted great labour and time to the subject, his conclusions are not convincing that the bodies observed in the blood of the animals were the same as those found in man, or that the phlebotomus is the transmitter of verruga.

P. W. B-S.

Townsend (Charles H. T.). **Two Years Investigation in Peru of Verruga and its Insect Transmission.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. July. Vol. 3. No. 1. pp. 16–32. With 2 plates.

In this paper the author maintains his belief in the unity of Oroya fever and verruga and the transmission of the disease by a night biting fly, the *Phlebotomus verrucarum*. He describes again the experimental evidence from animals and man which he has given in detail previously and he makes out a very good case for the Phlebotomus being the active carrier, but the experimental proof of the identity of the two diseases is not convincing. He admits that the clinching experiment with the seaman McGuire could not be carried out as originally intended, but *had it been done* a complete transmissional demonstration would have been secured.

The habits of the phlebotomus are very similar to those of the European species, living in damp soil rich in nitrogenous materials, removed from light in recesses of rock, walls and caves. The local loose rock or rubble wall furnishes ideal places for the flies to develop. They do not fly far, their greatest activity being between six and nine o'clock in the evening, and they are in greatest seasonal abundance during the height and close of the summer rains. As has been noticed elsewhere they feed upon lizards which frequent the same localities. He notes that were it not for the disease, the verruga zones in the Andes are climatically almost perfect and if freed from verruga, uta, and malaria, which he states are all insect-borne diseases, would form an immense region pre-eminently adapted for sanatoria.

P. W. B-S.

Gomez (Maximo E.), i. **Epidemiologia de la enfermedad de Carrion en las provincias de Yauyos e Cañete. Contribucion al estudio de la geografia patologica de la verruga.**—*Cronica Med.* Lima. 1913. Oct. 31. Vol. 30. No. 596. pp. 419–421; 1914. Mar. 15. Vol. 31. No. 605. pp. 75–77; Mar. 31. No. 606. pp. 85–90.

ii. **Epidemiologia de la enfermedad de Carrion.**—*Ibid.* Apr. 15. No. 607. pp. 100–102; Sept. No. 615. pp. 278–281; 1915. Jan. Vol. 32. No. 619. pp. 10–16.

These two papers are principally concerned with details of purely local interest as to the present-day distribution of Carrion's disease in Peru. In the first one, however, the author gives in addition an interesting account of how he and his brother both contracted the disease, as the result of passing a single night, in the course of a journey, in a locality known to be infected. It seems to be the general experience of travellers in Peru that the disease may be contracted in this way, whilst passage through the same localities in the day-time is perfectly safe. Epidemics occurring among gangs of labourers engaged on engineering works, may, for the same reason, be cut short by the issuing of mosquito curtains, or by removal to other sleeping quarters at the end of the day's work. All these facts point to the disease being conveyed by the bite of some nocturnal insect, possibly a mosquito; but nothing further, it is stated, has been ascertained in this direction up to the present time.

J. B. Nias.

Rebagliati (Raul). **Enfermedad de Carrion. Inclusiones celulares en los organos hemopoieticos y en los elementos cutaneos de la verruga.** [Cellular Inclusions in the Haemopoietic Organs in Carrion's Disease and in the Cutaneous Tumours of Verruga.]—*Cronica Med.* Lima. 1915. Feb. Vol. 32. No. 620. pp. 36–38.

A description of certain microscopic appearances found in the tissues in cases of Carrion's disease, and in verruga. The paper is not illustrated in any way, and seems to be only of the nature of a preliminary notice. Further analysis of it therefore appears to be unnecessary.

J. B. N.

MALARIA.

BARBER (M. A.), RAQUEL (Alfonso), GUZMAN (Ariston) & ROSA (Antonio P.). **Malaria in the Philippine Islands. II. The Distribution of the Commoner Anophelines and the Distribution of Malaria.** —*Philippine Jl. Sci.* Sect. B. Trop. Med. 1915. May. Vol. 10. No. 3. pp. 177–247. With 2 plates and 1 text-fig.

As the authors remark, this paper is based on work which is the logical sequence of that of WALKER and BARBER, whose report was reviewed in this *Bulletin*, Vol. 5, pp. 337–9. The object was to study more minutely the distribution of the commoner anophelines of the Archipelago and the distribution of endemic malaria, as determined by the parasite and spleen indexes of children, for the most part ten years and less of age. In short, the aim has been to establish a scientific basis for combating malaria in the Philippine Islands.

In the study of the distribution of anophelines the method was to collect the larvae and breed them out for identification. *Anopheles rossii* is by far the most abundant and widely spread. *A. febrifer* and *A. barbirostris* come next in order of abundance, though the former is more restricted in habitat than the latter. *A. sinensis* probably ranks fourth, though its relative abundance is difficult to estimate, as it is preferably a rice-paddy breeder. *A. maculatus* is probably the least plentiful. *A. rossii* and *A. febrifer* have been found in nearly every locality and *A. rossii* is by far the most adaptive, having been found in the very salt water of evaporating ponds used in obtaining salt and in brooks flowing from springs. *A. barbirostris* is widely distributed, but is less often found in foul water and is commonest where the water is comparatively fresh and aquatic plants are abundant. *A. febrifer* is more restricted in habitat and has never been found in brackish water. It shows a decided preference for clear flowing water, especially where there is abundance of overhanging grass, roots or other vegetation at the margin. It prefers brooks and small streams to large rivers. The two localities where *A. febrifer* has been found most abundantly are two small rivers—one in southern Mindoro and one in Negros. In the latter locality, a clear brook with steep banks and much vegetation, sometimes between 100 and 200 larvae could be taken up at one dip of a small collecting pan. *A. maculatus* has been found in the same sort of habitat as *A. febrifer*, but is far less common and much more restricted to very fresh water. *A. sinensis* appears to occur in about the same sort of locality as *A. barbirostris* but is much less frequently found.

A good deal of information regarding the habits of these mosquitoes, especially with reference to their visiting habitations and attacking human beings, has been collected. *A. febrifer*, like *A. rossii*, is a house-seeking species and readily attacks human beings. The flight of *A. febrifer* may be as much as 170 paces, although comparatively few got so far.

In studying the distribution of malaria in a locality both the parasite and the spleen indexes were taken by the examination of school children, the majority of whom were from 5 to 10 years of age. The

NOTE.—In the absence of Dr. A. BALFOUR, C.M.G., this Section is being undertaken by Dr. WENYON.

examinations were made during school hours. For blood examination the thick film method was largely depended upon, the thick films being stained for one hour without previous fixation in jars containing Giemsa-Romanowsky stain, 1 part in 40 parts of water. The results of the examinations are given in a long table which shows a parasite index of 11 and a spleen index of 13·3. This rate is probably higher than for children generally, since so many malarious localities were included. If only one town, Magdalena, is omitted from the list the parasite index falls to 6·8. The authors come to the conclusion that a spleen rate of over 10 indicates present or past malaria in most, if not all, the communities of the Philippines. However, they would not recommend that the malarial survey of a locality should rest on the spleen examination alone. In the town of Magdalena the children were examined on three occasions, with intervals of four and three months. As a result the percentage of infected children was as high as 72·4, and the authors think that repeated examinations of the children of this town during two years would give nearly 100 per cent. of positives.

Some experiments were made with a view to testing the effect of larvicides on streams. It was useless merely to throw it on the surface of the stream and allow it to float down, but it had to be distributed along the margins and worked in mechanically. For this purpose the best method was to use a can provided with a long spout and to work in the larvicide by means of brooms of stiff twigs. A practical application of the method was made by Dr. Diller on the Calamba Sugar Estate, with the result that a diminution in the number of mosquitoes and the cases of malaria was noted.

The authors write that they believe that the destruction of larvae by larvicides, and where practicable by the abolition of breeding and lurking places, offers more encouragement than any other antimalarial measures in the Philippines.

The authors' general summary is as follows :—

"1. The commonest species of *Anopheles* in the portion of the Philippines covered by our survey are *A. rossii, A. febrifer, A. barbirostris, A. maculatus,* and *A. sinensis.* It is probable that these are the commonest species of anopheles over the whole Archipelago.

"2. The results of this work and that of the work of Walker and Barber indicate that *Anopheles febrifer* and, to a less extent, *A. maculatus* are the chief transmitters of malaria in the Philippines.

"3. *Anopheles febrifer** is a stream breeder widely distributed and often recurring abundantly in the breeding places. It seeks houses and readily bites human beings.

"4. The distribution of malaria in the Philippines, as indicated by nearly 7,000 examinations of spleen or blood of school children, is by no means universal but is most abundant in such regions as afford breeding places for *A. febrifer* and *A. maculatus.*

"5. Antimalarial measures should be based upon a thorough anopheles and malaria survey, and those measures should be employed which will best meet the conditions. The best single measure is the destruction of larvae of malaria carriers, and in this work the breeding places of the stream breeders should receive first attention.

"6. Our own experience and that of others in the destruction of stream breeders by means of larvicides leads us to believe that this measure is a practical one in the Philippines and that it is within the means of many malarious communities in the Archipelago to reduce the amount of malaria by this measure."

C. M. Wenyon.

* See note by Ludlow, p. 338.

Mitzmain (M. Bruin). **Anopheles as a Winter Carrier of Plasmodium. The Mosquito as a Prophylactic Indicator.**—*U. S. Public Health Reps.* 1915. July 16. Vol. 30. No. 29. pp. 2117–2121.

The study was undertaken at Scott, Miss., on the property of the Mississippi Delta Planting Co. with the object of determining the possibility of hibernating mosquitoes carrying malaria over from one season to another. The period of observation was from February 3 to June 1, 1915. The anopheline mosquitoes were found under the floors of the dwellings in February, but in March few were found there and more were collected from the woods. It was at first attempted to catch only those at rest in their hibernating habitat, but this proved impracticable, so that eventually a horse was used as an attraction and the anopheles were then more readily captured.

As regards hibernation this does not truly occur in this region, for occasional sporadic flights and feeding prevail, as happened between Feb. 11 and 14, when a rise of 11° in temperature occurred. This rise resulted in a general house infection. During the three months Feb. 9 to May 9, 1,000 anopheles were dissected and no plasmodial infection noted. It cannot be determined absolutely that all these mosquitoes were of the autumn brood, but observations of the breeding places would support the view that till the latter part of April this was so.

Another series of observations was conducted on mosquitoes collected from negro cabins in which malarial gamete bearers were known to exist in the autumn. Eight such cabins were selected. Blood examinations made just prior to the mosquito dissections showed that at least six of these persons harboured gametes while in the two remaining only asexual forms were found. The cabins of the six gamete bearers yielded numbers of anopheles from May onwards. In one instance 24 *Anopheles quadrimaculatus* were removed engorged from the net of one man. The mosquitoes were kept till the digestion of the blood was sufficiently complete for dissection. More than 1,100 anopheles were examined during 20 days, and on May 15 two were infected with oöcysts, while a third was found infected on May 26. The bearing of this result would be that prior to the finding of infected mosquitoes the treatment by quinine of all human carriers would prevent the anopheles becoming infected.

The author's paper is merely a preliminary note pointing out the scope of the investigations which are being undertaken and are likely to yield most interesting results.

C. M. W.

Carter (H. R.). **Notes on Anopheles Production from a Malarial Survey.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. June. Vol. 2. No. 12. pp. 753–758.

The author gives an illustration of the different conditions under which Culex and Anopheles breed. A stream running for 3 or 3½ miles through a ravine received at its upper end a sewer. The stream gradually cleared till it again became contaminated by another sewer entering two miles below its origin. The stream was fed at many places by marshy effluents from springs 50–200 feet distant. Anopheles were breeding in numbers in these effluents of clear water and in the

water of the main stream where it was clear just above the entrance of the second sewer. In other places in the upper part of the stream and below the entrance of the second sewer where the water was contaminated there were Culex in abundance, but no Anopheles. Other illustrations of the preference of Culex for foul water are given.

Some evidence is brought forward to show that *Anopheles punctipennis* develops later in the season and in colder weather than *A. quadrimaculatus*. The former is not considered an efficient malaria carrier.

In certain places water showing Anopheles larvae did not produce mosquitoes for various reasons. Such places are called incomplete breeding places and result from the destruction of the larvae by fish or other causes, or from the removal to another place of the eggs or larvae, which completed their development there. In the latter case the place from which the eggs or larvae are removed and the place in which development is completed are both incomplete breeding places, whereas taken together they constitute a complete breeding place.

C. M. W.

Wrightson (Wm. D.). **Mosquito Eradication and Prevention. With Special Reference to the Malaria-bearing or Anopheles Mosquito.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. June. Vol. 2. No. 12. pp. 738–752. With 9 figs.

As the title indicates, this paper is an account of the methods of mosquito eradication and prevention. The subject is considered under the headings of Quinine Prophylaxis, Screening, Control of Carriers, Clearing of Vegetation, Filling, Oiling and Drainage. One or two points may be noted here. Mosquitos resting on the ceiling of rooms may be caught by holding below them a can with some kerosene in it fixed to a broom handle. The mosquito will fall into the can. Vegetation should be cleared close to the ground, preferably to within 500 yards of dwellings, so as to afford less shelter for mosquitoes and to disclose small, hidden breeding-places. For oiling crude oil direct from the wells of Tampico was first employed. This is too thick for use so that another preparation was used. For this purpose 150 gallons of crude carbolic acid (specific gravity not greater than 0·97) is heated in a tank ; 200 pounds of powdered resin is dissolved in the acid, and then 30 pounds of caustic soda dissolved in 6 gallons of water. The mixture is stirred while heated and is ready for use in a few minutes. In the drainage section earth drains, subsoil or tile drains, blind drains and concrete drains are all considered.

C. M. W.

von Ezdorf (R. H.). **Malaria in the United States. Its Prevalence and Geographic Distribution.**—*U. S. Public Health Reps.* 1915. May 28. Vol. 30. No. 22. pp. 1603–1624.

The information upon which this report is based was collected by the sending out of circular post cards to physicians and of a circular letter to all State Health Officers in the United States. The result of the inquiry is shown in a table. Replies by card were received from

13·25 per cent. of the recipients. The cases of malaria reported numbered 81,085, representing a morbidity rate of 5·36 per thousand amongst the estimated population of 15,112,970. Calculating on the basis of complete returns the number of cases would have been proportionately greater, giving a rate of 40·4 per thousand: or in other words 4 per cent. of the population or over 600,000 people in the eight States suffered an attack of malaria. Details of the figures received are given under the names of the various States.

C. M. W.

Linnell (R. M. C.). **Some Observations on Malaria on Rubber Estates.** —*Trans. Soc. Trop. Med. & Hyg.* 1915. July. Vol. 8. No. 8. pp. 239–261. With 5 charts.

The late author opens his paper by stating that the advice generally given to Europeans starting for the tropics is to take so much quinine a day and not to drink too much whisky. The traveller is led to believe that by these means he will escape malaria, or, should he be unlucky enough to contract it, the attack will be no worse than a slight attack of influenza at home. The author continues that he gave quinine, grains 5 (and more), as a prophylaxis against malaria to over 2,000 Tamil coolies for two-and-a-half years with most disappointing results; in fact, as soon as the coolies became accustomed to the quinine, it seemed to lose any beneficial effect it had had and acted almost as a slow poison. The Tamil coolie is a poor feeder—living chiefly on rice—and he has little or no stamina and will not use a mosquito-curtain, so if the district in which he lives is malarial he is practically certain to become infected. The other imported labour is Chinese. The Chinaman is a much better feeder, more robust, and uses his mosquito-curtain, and will exist where a Tamil dies.

The quinine used was the sulphate, chloride and bihydrochloride, administered in glycerine capsules and in solution. One sort of quinine did not give better results than another, though the coolie did not object so much to the capsule as to the solution. The capsule was washed down with a drink of ac. hyd. dil. or ac. sulph. dil. and was given at a muster held after the morning or afternoon meal under European supervision. If the quinine is given on an empty stomach the coolie generally vomits and cannot eat his rice; also vomiting often happens after a meal with quinine given in solution, so that the capsule is generally used. The afternoon muster is more convenient, for then the coolie has had his chief meal and his work is finished, so that he is more happy than in the cold early morning.

On an estate in typically broken country there was a double seasonal wave of malaria, the first synchronising with the first increase in the rainfall, being highest in April to June, the second just preceding the second increase in rainfall, being highest in September and October. This does not appear to correspond with any increase in fever-carrying mosquitoes, which were, if anything, more easily caught in the healthy period. On a healthy estate examined for comparison there was no increase in malaria with the rains, while fever-carrying mosquitoes could be caught in any quantity all the year round.

Twenty-four Tamil coolies newly arrived from India were placed to reside in an area surrounded by ravines. In these ravines the larvae of *Nyssorhynchus maculatus* were found in quantities. The coolies' bloods were examined and no sign of malaria was detected. They were given quinine grains 5 per day, followed by a drink of ac. hyd. dil. On the fourteenth day after arrival five had fever due to malignant malarial parasites. No parasites were found in the blood of the others. In another very unhealthy area a similar experiment was tried with larger doses of quinine, as follows :

Amount of Quinine daily.	Period.	Average labour force.	Percentage. sick daily.
Quin. sulph. grs. x. ..	6 months	24	15·7
,, grs. xv. ..	5 ,,	30	19·7
,, grs. xx. ..	5 ,,	25	19·5

The sickness was practically always due to malaria, and after the sixteen months 25 per cent. harboured malarial parasites. These coolies, the author thinks, probably developed a quinine-fast parasite, for when they came into hospital on a healthy site recurrences were extremely common on quinine grains xlv. per day.

In another experiment two batches A and B of 90 coolies each were employed. They were coolies who had been having quinine grains v. daily for over 2 years. Batch A was given no quinine, but instead decoction of coriander by way of giving them something, and also because of a native belief in its efficacy. Batch B was given as before quinine grains 5 daily. The observation was continued for 8 weeks, and the first effect was that the cases of sickness and of malaria dropped markedly during the first week amongst the coolies of batch A. At the end of the period those who had had the quinine regularly had fared worse than those who had had none.

	A. (90 Coolies). Coriander Decoction.		B. (90 Coolies). Quinine grs. v. daily.	
	Sick (all causes).	Clinical Malaria.	Sick (all causes).	Clinical Malaria.
1st week ..	25	9	57	27
2nd ,, ..	34	22	57	26
3rd ,, ..	41	22	44	14
4th ,, ..	39	21	47	17
5th ,, ..	28	16	29	15
6th ,, ..	33	17	39	30
7th ,, ..	32	14	42	20
8th ,, ..	22	10	27	15
	254	131	342	164

The batches were then changed over for 8 weeks, the quinine being given to A while B had the coriander. At the end of the period it was again found that the quinine batch had suffered more severely.

	B. (90 Coolies). Coriander Decoction.		A. (90 Coolies). Quinine grs. v. daily.	
	Sick (all causes).	Clinical Malaria.	Sick (all causes).	Clinical Malaria.
1st week ..	35	20	39	12
2nd „ ..	24	10	33	16
3rd „ ..	21	10	31	15
4th „ ..	26	14	25	12
5th „ ..	27	10	26	11
6th „ ..	21	10	21	15
7th „ ..	27	14	27	11
8th „ ..	19	8	29	17
	200	96	241	109

Some observations seemed to indicate that decoction of coriander had some effect on the malarial parasite, and it is stated that beneficial results followed the use of quinine grains v. daily for a week followed by decoction of coriander for a week. A table of cases shows that the quinine grains 5 and coriander on alternate weeks gave better results than continuous quinine grains 5 daily.

Several cases of Europeans are quoted who commenced by taking daily doses of quinine and finally gave it up. The author writes that in his experience a European arriving in the tropics usually takes his daily dose of quinine until he has had malaria twice. He then takes it in larger doses when he thinks he wants it and seems to be much better.

The quinine grains 5 daily and coriander on alternate weeks gave better results than quinine grains 5 on every 6th and 7th day.

The author makes some remarks on the treatment of the cases which came into hospital. On admission the patient has a dose of mist. alba and is put on milk and sol. quin. grs. xv. t.d.s. Next day he has ankylostome treatment—oleum chenopodium minims vii. at 6 a.m., 7 a.m. and 8 a.m. in glycerine capsule, being allowed no solid food. At 11 a.m. he has an aperient. There seems to be no danger in this treatment and it clears out all kinds of worms. If on admission the malaria is very intense and the patient comatose or collapsed, in addition to strychnine, brandy, etc., the quinine is given by the mouth (if necessary through a nasal tube), as in the author's experience injections of quinine are practically useless.

Recurrences are exceedingly common about the tenth day. To combat this neosalvarsan was tried (intravenously 4 grains in 10 cc. distilled water). Great benefit followed its administration between the sixth and eighth days after the appearance of parasites or fever. In all cases the quinine treatment was continued also.

It is mentioned that the Chinese have an idea that pineapple is very good for getting rid of oedema, generally of beriberi origin. Its use in enlarged malarial spleen was followed by marked reduction in the size of the organ. The pineapples which gave the best results were the Mauritius variety not quite ripe. One or two a day were eaten by each patient.

There are many interesting points in the author's paper which have not been mentioned here, as, for instance, a series of tables illustrating the interval elapsing before treated cases had relapsed after their return to work when they had continuous prophylactic quinine, or quinine on alternate weeks only. Those who wish further details must consult the original article, which is followed by a series of useful criticisms by Sir Ronald Ross, Dr. Andrew Balfour and others who attended the meeting of the Society at which Dr. Linnell's paper was read. The following seven conclusions were drawn by the author :—

"1. Quinine grs. v. daily will not stop an attack of malaria, if the patient lives in an unhealthy area.

"2. No amount of quinine on which the coolie can do his work will stop the seasonal wave in ravine country. The area must be sub-soil drained to do this.

"3. Interrupted administrations of quinine will do much to prevent the malaria taking a serious form.

"4. In severe cases of malaria (cerebral cases) the best treatment is to wash out the stomach and give quinine, in plenty, by the mouth.

"5. The best treatment for recurring cases of malaria is intravenous injections of neo-salvarsan, on the sixth to eighth days following the appearance of parasites or fever, followed by quinine.

"6. Pineapples have an effect in reducing malarial spleens and also raise the haemoglobin index. Quinine and pineapples should be given together.

"7. Oleum chenopodium is the most efficient vermifuge for removing ankylostome worms. When ankylostomiasis is uncomplicated with malaria, it does not seem to be very debilitating in Selangor."

C. M. W.

Minerbi (Giacomo). **Campagna antimalarica 1913. (Relazione medica pel dominio Khediviale di Dalaman).** [The Antimalarial Campaign of 1913 in the Khedivial Domain of Dalaman.]- *Ann. d'Igiene Sperimentale.* 1915. Vol. 25. (N. ser.) No. 3. pp. 205–233. With 2 maps.

A report of medical work for the year 1913 in a small territory under Egyptian control on the coast of Asia Minor, opposite the island of Rhodes. The population of the district is roughly estimated at 3,000 persons, mostly engaged in agriculture. The country from its configuration is marshy, and malaria is prevalent. In the 12 months 135 persons were treated for malarial symptoms with two deaths, while the numbers under prophylactic treatment with quinine ranged from a monthly maximum of 1,266 in June to 432 in December. As the year 1913 was the first in which any kind of prophylactic treatment had been attempted, naturally no comparative table of results can be presented. The author, however, seems to have made a very good beginning in dealing with the malarial scourge in a new locality. The quantity of quinine employed amounted to 165·5 kilogrammes in all.

J. B. Nias.

Bass (C. C.). **Specific Treatment of the Malignant Forms of Malaria.** —*Jl. Amer. Med. Assoc.* 1915. Aug. 14. Vol. 65. No. 7. pp. 577–578.

By the term "malignant forms of malaria" the author means those that prove fatal, those that would prove fatal without treatment,

and those that are sufficiently severe to immediately endanger the patient's life. Nearly all such cases are due to the malignant malarial parasite *P. falciparum*. This parasite spends about three-fourths of its life lodged in the capillaries and only one-fourth in the circulating blood. This fact in itself enables it to produce the malignant type of malarial fever, for the large number of parasites lodged in the capillaries may be the chief source of malignant symptoms. Coma in malaria is due to anaemia of the brain.

Quinine in the blood does not reach the parasites lodged in the capillaries, but if in sufficient concentration it kills those in the circulating blood. The plasmodia in the capillaries come into the circulating blood after they segment and are then exposed to the action of the quinine. Since in the infection with *P. falciparum* there is continuous segmentation—each parasite segmenting independently of the rest—there is a continuous appearance of young forms in the blood, so that to combat these there must be present constantly in the circulating blood a sufficient concentration of quinine. When quinine is introduced directly into the blood it appears in the urine in a few minutes, and many individuals eliminate more than 50 per cent. in the first 12 hours and practically all within 24 hours. Thus it is seen that in order to have a sufficient concentration of quinine in the blood constantly it is necessary to administer it every few hours during this period.

There are three methods of quinine administration—by mouth, hypodermically or intramuscularly, and intravenously. Administration by mouth is often impossible, and if it can be administered it is frequently vomited. Often it is not absorbed and many a patient dies with enough quinine in his stomach to have saved his life if it had been given properly.

Administration into the tissues by means of a hypodermic syringe is in the case of some drugs a rapid method for getting them into the blood, but it is not so with quinine, which causes severe local damage and frequently necrosis, even in its least irritating form—the bimuriate with urea. Absorption is accordingly very irregular, so that again many a patient has died of malaria with more than sufficient quinine in his tissues to have saved his life it it had been properly administered.

The proper method of administration in these cases is intravenously. It is never necessary to give more than 30 grains in 24 hours and never more than 10 grains at one time. Large doses given intravenously are very dangerous. Twenty grains often produces considerable shock, dizziness and nausea, while 50 grains has killed in several cases. The author says he has known several instances in which a 100 grains or more of quinine has been administered during the last 24 or 36 hours before death. In such cases the necropsy fails to reveal sufficient plasmodia to account for death. In other words death has resulted from quinine poisoning. Danger can be avoided by giving 10 grains of quinine hydrochloride intravenously every eight hours or 5 grains every four hours, and this will kill the plasmodia in the blood stream and prevent their reproduction as certainly as any larger quantity. It is mentioned that theoretically amyl nitrite inhalations should dislodge plasmodia from the capillaries and may be of use after quinine has been introduced into the blood.

In many cases of malignant malaria the actual volume of malarial parasites is very great, and, assuming one cell in five to be infected, the volume of parasites in the body may reach one pint.

As regards malarial haemoglobinuria there is no indication for quinine, for the infected cells are the ones most easily haemolysed and their parasites escape into the plasma, which destroys them. There is even a contra-indication, for quinine tends to increase haemoglobinuria.

C. M. W.

Shircore (J. O.). **Intravenous Injection of Quinine.**—*Trans. Soc. Trop. Med. & Hyg.* 1915. July. Vol. 8. No. 8. p. 282.

The author writes that he has seen no harm result from the intravenous injection of the contents of the ordinary ampoules (B. & W.), containing 10·34 grains of quinine hydrochloride in 1 cc. without any dilution whatever. The injections were performed slowly. In one of the four cases thus treated another injection was given within three hours of the first. The effect on the course of the disease was marked, the patients making uneventful recoveries on quinine continued by the mouth.

C. M. W.

Medical Missions in India. 1915. July. Vol. 21. No. 82. pp. 78–96. —**Symposium: The Treatment of Malarial Fever.**

The opinions of seventeen medical men on the treatment of malarial fever in India are set forth in this paper. Practically all of the writers who have tried the method speak highly of intramuscular injections of quinine in certain cases in which quinine by the mouth cannot be administered. Some advise the employment of this method for purely prophylactic reasons. Muir, writing from Kalna, believes that the value of these injections is due to the irritation causing a general leucocytosis, and he advises the intramuscular injection of a mixture (Turpentine 1, Camphor 1, Creosote 1, Olive oil $2\frac{1}{2}$) in doses of about 5 minims for an adult in place of the quinine injection, which is often painful. This is a form of treatment which the author recommended a few years ago for the treatment of kala azar, for which larger doses and more prolonged treatment have to be adopted. Some of the writers find that quinoidine (the residual alkaloids of Cinchona) is quite useful for ordinary cases of malaria and has the advantage of being cheaper than quinine. All are agreed that quinine by the mouth is the usual method of treatment; most are in favour of continual dosage with quinine as a prophylactic measure.

C. M. W.

Liefmann (Emil). **Ein Beitrag zur Chemotherapie der chronischen Malaria.**—*Therapeut. Monatshefte.* 1915. May. Vol. 29. No. 5. pp. 260–261.

A case of malarial anaemia with marked enlargement of the spleen and persisting gametocytes in the blood was treated with ethyl-hydrocuprein (Optochin hydrochloride) in doses of 0·5 gram three times a day during a period of three weeks. There resulted an immediate improvement in the general condition and disappearance of the spleen tumour, so that the case could be considered as cured. The use of

this drug would appear to be indicated in cases where quinine could not be employed, but from the scanty data it is difficult to judge if one can speak of a *Therapia sterilisans magna*. C. M. W.

Barlow (Nathan). **Intravenous Mercuric Chlorid in Malaria. Preliminary Report.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. June. Vol. 2. No. 12. pp. 764–766.

The author, writing from Cuyamel, Honduras, commences his paper by pointing out that "throughout the entire south, both the rank and file of the profession and the laity are firmly convinced of the value of calomel in malaria, and in almost every locality some old practitioner will relate cases of chills and fever cured by calomel alone." To test the validity of this claim calomel was tried on a case of malaria in a white man, who was unable to take quinine owing to a marked idiosyncrasy against the drug. Salvarsan 0·6 gram had been tried and, though improvement had resulted, the infection was not destroyed, and the patient commenced to have regular paroxysms again. He was then put on calomel, 2 grains every other night for two months. Rapid improvement ensued and after one month parasites were no longer to be found in the blood. He was under observation for a period of six months and remained free from symptoms and plasmodia.

Encouraged by this result, and taking into account the slow and uncertain absorption of mercury when given by ordinary methods, intravenous injection of perchloride of mercury was tried on a patient whose blood showed very heavy tertian infection. An intravenous injection of slightly less than one-fourth of a grain of mercuric chloride was given at 10 a.m. on the day on which the chill was due at 4 p.m. The paroxysm did not appear, but was replaced by a gentle fever beginning without chill at 2 p.m., the temperature rising to 101·6° at 5 p.m. There were no further symptoms of malaria. The patient had suffered from malarial paroxysms occurring every other day during the nine days before treatment, and he had taken a single 5-grain capsule of quinine, which had had no effect on the blood picture.

The author is of opinion that the action of the mercuric chloride is a direct one upon the parasite, while the quinine acts indirectly by decreasing the stability of the red blood cell. C. M. W.

Stott (H.). **Studies in Malaria.**—*Indian Med. Gaz.* 1915. July. Vol. 50. No. 7. pp. 250–255. With 5 charts.

This paper is a continuation of a series of Studies in Malaria which have been reviewed [this *Bulletin*, Vol. 6, pp. 77–85]. The author now records his experience in the use of salvarsan in five cases of malaria. He comes to the conclusion that the drug has some undoubted specific action on the asexual forms of the parasite, but has no power of preventing the appearance of the sexual forms. The dose given was 0·5 grains [½ grams]. The details of the cases are shown in a table which is reproduced here. The heading of column J.—"Quinine or not"—means the subsequent use of quinine in order to bring about the cure which salvarsan had failed to produce.

C. M. W.

TABLE FROM H. STOTT'S PAPER SHOWING THE EFFECT OF AN INJECTION OF SALVARSAN IN FIVE CASES OF MALARIAL DISEASE.

—	—	A.	B.	C.	D.	E.	F.	G.	H.	I.	J.
Case.	Diagnosis.	Action on fever.	Spleen.	Asexual forms of parasite.	Large Mononuclear percentage.	Effect on strength of Patient.	Gametes appeared after.	Fever returned after.	Result.	Disposal.	Quinine or not.
I.	M.T.M.	Stopped at once	Diminished size	Eliminated for 14 days	..	Weakened	2 days	14 days	Relapsed	Sick leave	Q.
II.	M.T.M.	Do.	Do.	None found	Diminished	Poisoned	Do.	Did not return	Apparent cure	Sick leave Medical Bd. Invalided	*Nil*
III.	Q.M.	Do.	No spleen observed	Eliminated entirely	Do.	Improved	9 days	22 days	Apparent cure relapsed	Duty	Q.
IV.	Q.M.	Diminished three attacks	Do.	Diminished for 9 days	No effect	*In statu quo*	3 days	At once	Practically uninfluenced	Sick leave Death	Q.
V.	B.T.M. / M.T.M.	No practical effect	Do.	Eliminated / Eliminated for 2 days.	Do.	Do.	*Nil* / 5 days	Do.	Uninfluenced.	Duty	Q.

da Matta (Alfredo A.). **Casos de pseudo-tabes palustre no Amazonas. Notas para o seu diagnostico differencial. Pathogenia.** [Cases of Malarial Pseudo-Tabes in the Amazons. Notes on its Differential Diagnosis. Pathology.] *Brazil Med.* 1914. Nov. 1. Vol. 28. No. 41. pp. 381–383; Nov. 8. No. 42. pp. 391–393; Nov. 22. No. 44. pp. 405–407.

The author, who practises at Manaos in Brazil, furnishes some interesting notes on that rather rare complication of malaria, pseudo-tabes, of which he has seen altogether 18 cases. The histories of three patients, all adult males, are given at length. The paralysis appears to attack all the extremities simultaneously like ordinary peripheral neuritis. In the arms flexion and extension of the limb will be performed with difficulty, while the powers of movement in the hand will be almost entirely lost. Similarly, the power of walking will be almost or entirely lost from the paralysis of the feet, while the patient will retain considerable power of flexing the limb on the trunk, or the lower leg at the knee, when lying down. The patellar and plantar reflexes are reduced or abolished. Loss of cutaneous sensibility follows very closely the distribution of muscular paralysis. The patients have generally been severely attacked by malaria, and the symptoms generally supervene in the chronic or apyrexial stage. The blood may show crescents. The spleen and liver will be large and tender, and the presence of urobilin in the urine is an important diagnostic sign. The haemoglobin in the blood may be only 40 or 50 per cent. of the normal. Palpitation on exertion in proportion to the anaemia, with coldness and clamminess of the extremities, will probably be present.

The differential diagnosis from alcoholic neuritis and true tabes dorsalis is not difficult, but there are in the Amazon valley forms of paralysis of the beriberi type with which the disease may be readily confounded. These beriberi forms have been described by Lovelace [this *Bulletin*, Vol. 1, p. 484], their true nature being still doubtful. If the case is really malarial, active treatment with quinine, galvanization, and so forth, will speedily bring about a complete cure. In one of the cases narrated recovery was complete in 23 days, and in another in 2 months, whilst the third was sent away by sea to a more healthy locality, namely, Belem. The author points out that Manson has drawn more attention to these forms of malarial paralysis than any other writer.

J. B. N.

de Figueiredo (Antonio Gonçalves). **Um caso de kysto hematico da vesicula biliar de natureza palustre.** [A Case of Haemorrhagic Cyst of the Gall-Bladder of Malarial Origin.]—*Arch. Brasil. Med.* 1915. Jan. Vol. 5. No. 1. pp. 54–60. With 1 text-fig.

The patient was a woman of 38 years of age, who had suffered from malaria. About four years previously to coming under observation, as the result of getting up suddenly in the night and tying her clothes tightly round her, she was conscious of a pain in the region of the liver, which caused her to exclaim that her liver had fallen out of place. The sensation was followed by rigors and the appearance of a tumour in the hepatic region of the size of a lemon.

On coming under observation the liver was found to be dragged downwards, so that its upper surface could be felt in the epigastrium while its lower border descended to the pelvic brim. Continuous with the liver margin was a large cystic tumour, the spleen being likewise enlarged and measuring 23 by 18 centimetres. A laparotomy was performed and the cyst tapped and sutured to the margins of the wound. Two litres of a chocolate-coloured fluid were drawn off which was found microscopically to consist wholly of altered blood without any admixture of bile. The cystic duct was found to be obliterated. A number of malarial crescents were found in the evacuated blood to the number of two or three in each preparation. A portion of the cyst-wall was excised and examined microscopically, and found to consist exclusively of thickened gall-bladder tissue. The patient made a good recovery.

J. B. N.

Levy (S.). **Eine Malaria-Infektion in Cöln.**—*Deut. Med. Woch.* 1915. July 15. Vol. 41. No. 29. p. 861.

The case recorded is of a child six years of age, who contracted malarial fever in Cologne. The parasites in the blood were of the benign tertian variety. The parents of the child are quite unable to show that the child associated in any way with any person suffering from the disease.

C. M. W.

Brignone (E.). **La Propaganda e Profilassi Antimalarica nelle scuole comunali di Terranova Monferrato durante l'anno 1914.**—*Malariologia.* (*La Propaganda Antimalarica*). 1915. June 15. Vol. 8. No. 3. pp. 63–72.

Of the 280 children attending the elementary schools of the district of Terranova Monferrato during the year 1914, 238 were systematically treated prophylactically with quinine, with the gratifying result that not one of them developed symptoms of malaria during a period of treatment extending from March 16th to July 1st.

J. B. N.

Ludlow (C. S.). **A Question of Synonomy.**—*Milit. Surgeon.* 1915. June. Vol. 36. No. 6. pp. 505–508.

From this note it appears that the mosquito named *A. febrifer* sp. nov., in Walker and Barber's paper on Malaria in the Philippine Islands [see this *Bulletin*, Vol. 5, p. 337 and above] is really *A. christophersi* Theobald. It is explained how the error arose. The synonymy is

Anopheles (*Myzomyia*) *christophersi* Theobald =
alboapicalis Theobald.
Mangyana Banks.
funesta Ludlow non Giles.
flavirostris Ludlow.
febrifer Banks.

Moreover the *A. rossi* of the same paper should be *A. indefinata*, the true *rossi* not occurring further east than India and Ceylon (Edwards).

[According to Mr. Guy Marshall the proper name for "*A. febrifer*" is *A. minimus* Theo. (*Review of Applied Entomology*, Series B, 1915. May. Vol. 3, p. 65).]

A. G. B.

Cardamatis (Jean P.). **Du Paludisme dans la Grèce Continentale depuis les temps les plus reculés jusqu'à l'époque Macédonienne.**—*Arch. f. Schiffs- u. Trop.-Hyg.* 1915. May. Vol. 19. No. 10. pp. 273–286; June. No. 11. pp. 301–312.

This paper is of much interest from the historical point of view, setting forth the results of the author's researches into classical literature with a view to showing that malarial fever has existed in Greece from the most remote period of its history. He shows that many of the plagues and pestilences which attacked the ancient races were really epidemics of paludism, and some of the disasters which befell the great armies of ancient times, as during the period of the battle of Marathon, were due to the ravages of this disease. The paper should be consulted by all interested in the historical aspect of this most interesting subject.

C. M. W.

O'Connell (Mathew D.). **The Meteorology of Malaria.**—*Jl. Trop. Med. & Hyg.* 1915. Aug. 2. Vol. 18. No. 15. pp. 169–170.

In a table the author sets forth the atmospheric conditions in Colon, at the Pacific end of the Panama Canal, for a continuous period of 48 hours in the month of August, when malaria is prevalent, with a view to illustrating his theory that under certain conditions there is retention or accumulation of water in the body, thereby increasing destructive metabolism or heat production and impeding heat loss. That there is an increase of water in the blood in malaria, he says, is well recognised by malariologists. Human blood on an average contains 79 per cent. of water—some men having, say, 78, and others 80 per cent. If water is retained owing to atmospheric conditions at the rate of 1 per cent., then at the end of such a period the two men will have 79 and 81 per cent. respectively. According to the author the production of heat in the latter man will be greater than in the former—the one will have fever and the other will be immune.

[It is difficult to follow this argument, which appears at any rate to ignore the existence of the malarial parasite.]

C. M. W.

La-Puente (Ignacio). **Paludismo en la costa del Perú. Etiologia—Formas Clinicas—Profilaxis.** [Malaria on the Coast of Peru.]—*Memoria presentada al V Congreso Médico Latino-Americano.* Lima. 1914. 69 pp.

A report presented to the 5th Latino-American Medical Congress on the subject indicated by the title.

The littoral of Peru extends from 4° 40′ to 19° 12′ of South latitude; that is to say, it is about 2,500 kilometres in length. It is traversed by as many as 45 different rivers, which take their rise on the western slopes of the Andes and fall into the Pacific Ocean. In the lower parts of their respective courses the majority of these rivers give rise to swamps of greater or less extent, which, as a matter of course, breed malaria, if the temperature of the locality is high enough, as it always is near the sea-level. The prevalence of malaria in Peru varies with

the time of year, and does not coincide with the period of the greatest prevalence of mosquitoes, a fact which appears to lead Peruvian practitioners, if the author of this memoir is to be trusted, to ascribe the propagation of malaria to other agents besides mosquitoes, such as air and drinking water. In fact, if one may be permitted to say so, the views emitted by the author on the subject of the propagation of malaria appear to be a trifle old-fashioned, being mainly based on the earlier writings of Laveran and Le Dantec, both of whom are frequently cited. In the city of Lima and its suburbs the largest number of cases of malaria occur in the first six months of the year, between January and June, the months of January, February and March being those of greatest rainfall and maximum heat; mosquitoes are, however, most prevalent in the last six months of the year, which are the coolest and driest. In Lima, *Plasmodium falciparum* is the parasite most frequently found in the blood of patients, *P. vivax* coming next and *P. malariae* last. The dominant Anopheles in the environs of Lima is *A. superpictus* or a variety of the same.

J. B. N.

MISCELLANEOUS.

East Africa Protectorate. **Nairobi Laboratory Report (Bacteriological Section) for the Months Jan.-June 1914.** Vol. 5. Pt 1. [J. H. Harvey Pirie, Acting Government Bacteriologist.]—20 pp. 1914. Nairobi: Printed by the Govt. Printer.

In the six months under review there was again an increase in the number of examinations made in the laboratory, largely due to the number of rats (3274) examined for plague. The author had the misfortune to lose nearly all his laboratory animals, owing to the depredations of a mongoose and disease. A table shows the monthly incidence of malaria with the monthly rainfall. With respect to enteric fever "the number of cases for examination and the number giving a positive Widal reaction showed a very considerable increase . . . . not confined to any one district, but fairly widely spread." Sixteen rats were plague infected out of 3,274; all were captured or found in Nairobi, on various dates and scattered through the town.

A possible source of error in the diagnosis of schistosomiasis was "a large number of rounded spiny tetrahedral bodies and a smaller number of bodies not unlike Schistosoma ova in size and general appearance, including a 'spur' in a lateral position" found in a sample of urine. The Government Mycologist identified the first as the uredospores and the second as the teleutospores of *Hemileia vastatrix*, the organism of coffee blight.

Organisms "more or less closely corresponding with dysentery bacilli" were isolated from five cases. Their investigation is in progress. The new Nakuru water supply was reported on as not suitable for drinking purposes in its raw state, but only after storage, liming and filtration. The Nairobi water was found to contain "a sufficient number of organisms indicative of faecal contamination to raise suspicion that it may well be the cause of the dysenteric conditions so common in Nairobi the past few months."

A. G. B.

Sergent (Edmond). **Rapport sur le Fonctionnement de l'Institut Pasteur d'Algérie en 1914.**—25 pp. With 1 chart. 1915. Alger: Imprimerie administrative E. Pfister, 9, Rue Trollier.

In spite of the diminution of personnel in consequence of the war the work of the Pasteur Institute of Algeria has continued to develop. At the time of mobilisation the Institute was put at the disposal of the military authorities. Between August and December there were prepared and distributed to the army nearly 70,000 doses of anti-smallpox vaccine and 391,000 cc. of antityphoid vaccine, enough for the vaccination of 75,000 men. The laboratory at Beni-Ounif-de-Figuig in the Sahara, in accordance with the programme drawn up in 1908, has begun to give off offshoots and a laboratory has been created at Beni Abbès, in the extreme south of Oran. At the Pasteur Institute 3,500 analyses were made in the year. Of these the following are of interest:—Microscopical examinations for the diagnosis of tuberculosis 342, of malaria 110, diphtheria 68, relapsing fever 65, cerebro-spinal meningitis 49. Sero-diagnostic examinations have been made for typhoid fever 554, paratyphoid A 434, paratyphoid B 425, undulant fever 137; blood cultures for the same diseases 137.

The total number of persons treated for rabies was 1,191. Of people bitten by animals in whom rabies was experimentally recognised at the laboratory there were 72 and no deaths; of people bitten by animals in whom rabies was recognised by veterinary examination there were 416 with one death; 727 people had been bitten by animals suspected of rabies, with four deaths. Other details are given.

Malarial prophylaxis has gone on as in preceding years. In one of the three places chosen out of the most feverous for demonstration, Montebello, there has been an interesting experience showing the efficacy of the prophylactic measures taken and the need for their continuation. These measures, which have been regularly practised for the last ten years, had caused the disappearance of malaria amongst the Europeans; there had not been during that time a single case of infection amongst infants or new comers. When the war broke out the anti-larval measures were interrupted for a month; mosquitoes reappeared in the village, and malaria. As soon as antimalarial measures were reinstituted all was well. Similar observations have been made in other localities.

In 1914 the Pasteur Institute has given out over two and a half million units of serums, vaccines, or medical and veterinary biological products. Details are given. An account is given of the researches prosecuted during the year with a list of publications; these have been adequately treated in the *Bulletin*.

A. G. B.

Vialatte (Ch.). **Rapport sur le fonctionnement du laboratoire de microscopie de Beni-Abbès en 1914.**—*Bull. Soc. Path. Exot.* 1915. Feb. Vol. 8. No. 2. pp. 66–70. With 1 chart.

The laboratory at Beni-Abbès, in the Sahara at 30° N., has been in full working since May, 1914. It is an offshoot of the Pasteur Institute at Algiers and is attached to the garrison hospital.

In 51 patients whose blood was examined malarial parasites were found seven times (benign tertian 5, malignant tertian 2), and the spirochaetes of relapsing fever eight times. Of 113 children, from fifteen downwards, 22 had splenic enlargement, in 25 crescents were seen, in 7 benign tertian parasites, and in one quartan.

Purulent conjunctivis is common, due to the bacillus of Weeks, the gonococcus, and the diplobacillus of Morax-Axenfeld in that order. Trachoma however is the most wide spread of eye diseases.

An epizootic of debab raged in the neighbourhood in 1914. Trypanosomes were found in 13 out of 73 camels, and two out of 31 horses. Clinical observation suggested that direct contagion "by the mucosae" might have occurred.

A. G. B.

Australian Institute of Tropical Medicine, Townsville, Queensland. **Half-Yearly Report from 1st January to 30th June 1914.** [Director A. Breinl].—13 pp. f'cap. Printed and published by Albert J. Mullett, Govt. Printer.

During the period under review Breinl and Priestley continued the enquiry into the health and general condition of school children in Townsville begun in 1913. It was sought to ascertain whether the

blood of children of European descent born in Queensland was normal as far as the formed elements were concerned. The result of 580 complete blood counts and haemoglobin estimations was to give figures corresponding to what is considered normal for Europeans living in a temperate climate [see this *Bulletin*, Vol. 5, p. 371]. An Arneth count was made on 150 school children at the same time. The result showed a decided "shift to the left" resembling the figures obtained for patients suffering from infectious disease. This alteration appears to be due to climatic influences only (*loc. cit.* p. 372). Breinl has discovered the parasite of Gangosa in New Guinea, a Cryptococcus which he has named *C. mutilans* [see this *Bulletin*, Vol. 6, p. 141].

Breinl and Young studied a number of cases of lead poisoning in children (*loc. cit.*, Vol. 5, p. 437).

During the six months 112 cases were treated by Breinl and Priestley in the tropical wards of the Townsville General Hospital. These included ankylostomiasis (20 cases), typhoid (35), "indefinite fever" (15), filariasis (8), sprue (7), malaria (3).

The Report of the Biochemical Laboratory is by Dr. Young. Observations on the intensity of the violet and ultra-violet rays in the sunlight went to show that a high intensity in these rays is not a feature peculiar to tropical sunlight [this *Bulletin*, Vol. 4, p. 529].

A study was made of the nitrogenous metabolism in a case of chyluria. The quantity of chyle in the urine, as measured by the proteins excreted, was the same whether the diet was rich in fat or fat free, so that the practice of reducing fats to a minimum does not seem to be justified. The quantity of protein in the urine appears to be the best guide to the condition of chyluria patients since these are the substances which form the clots and cause difficulty in passing urine [this *Bulletin*, Vol. 5, p. 15].

A study of the general metabolism of white people in the tropics is being carried out. As a beginning data have been collected with respect to the body temperature. The temperatures of six males have been taken at fixed times of the day over periods of at least two weeks, in both mouth and rectum. Considerable individual differences were noted, unconnected with length of residence in the tropics. The temperatures observed resemble those found by Pembrey in workers in cotton mills and factories where a high humidity prevails. Rectal temperatures above 100° F. were frequently observed.

Experiments were made on the protein metabolism of the body. In the four cases observed there were no striking deviations from the results obtained in temperate countries.

Black pigment was extracted from the skin of an Australian native and a small quantity obtained pure. A solution in alkali was examined spectroscopically. It was found to absorb all the rays in the violet end of the spectrum, the yellow and red being quite unaffected.

Dr. Nicoll reports from the Parasitological Department. An investigation was undertaken on the effect of salt and other substances in arresting and preventing the development of the eggs and embryos of the human hook-worm. Common salt in solutions of varying strength was employed. Even with a 6 per cent. solution it was found that several eggs were capable of hatching out for as long as six days.

"From this it is evident that a continued application of a strong solution of salt for at least a week is necessary to make certain of destroying all the eggs in the infective material."

Work was continued on worm-nodules in cattle.

One hundred and thirty five mosquitoes of seven species were examined for bacteria. These were found nine times, in *S. fasciata* five, in *Culicelsa vigilax* four times. None of these could be identified with disease-producing organisms.

Dr. Priestley reports on bacteriological work. All patients admitted to hospital with symptoms clinically resembling typhoid were carefully examined bacteriologically; in only one case was the typhoid bacillus isolated from the blood. The Widal reactions were typical in only a few cases. He believes that there are "several varieties of fever in North Queensland which while resembling typhoid fever in some respects differ markedly in other respects." Some attention was given to water examination.

Dr. Taylor reports from the Entomological Department, chiefly on the results of a survey of the blood-sucking insects of Australia.

A. G. B.

Harvey (W. F.) & Acton (H. W.). **Blood Characters: Their Variability and Interdependence.**—*Indian Jl. Med. Research.* 1915. Jan. Vol. 2. No. 3. pp. 721–732. With 2 charts.

The authors write that many different characters have been taken as indications of the state of the blood, such as number of red corpuscles, quantity of haemoglobin etc., but comparatively little work has been done to determine how far they are related to one another in the sense that they vary together. The observations were made on adults who came to the Pasteur Institute of India for anti-rabic treatment. Care was taken to exclude any obvious pathological state. Other observations were made at Kasauli in the sub-Himalayan region. They determined (1) the variability of certain blood characters in normal individuals; (2) the correlations of these characters; (3) the degree of alteration of these with 14 days residence at 6,000 ft. above sea level. A large section of the paper is occupied by the technique and tables.

The findings were as follows:—

"1. There is little variation in the resistance of red blood corpuscles to the action of hypotonic solutions either amongst individuals themselves or as between individuals on their first arrival at a high altitude and after residence there for a period of fourteen days. The same applies to the chloride content of the blood serum. . . .

"2. Number and volume of red blood corpuscles, specific gravity, and haemoglobin content of the blood vary to a very considerable extent in conditions of apparent health. The extent of the variation must be, we are inclined to think, greater in the Indian than in the European. This may very likely be due to the fact that the Indian suffers largely in the ordinary course of his daily life from disease conditions which markedly affect blood characters. . . . We have described this population as 'apparently healthy.' This means that besides taking count of external appearance we have excluded such cases as developed a definite attack of malaria during the period of observation. No other selection than this was made however.

"3. The correlation between such characters as number and volume of red blood corpuscles, haemoglobin content, and specific gravity, etc., is close.

"4. There is an increase in total volume of red blood corpuscles, haemoglobin content, and specific gravity with residence at a high altitude, as we should expect from the correlation of each of these characters with number of red blood corpuscles."

A. G. B.

KNAPP (H. H. G.). **The Significance of Arneth's Leucocyte Count.** —*Indian Med. Gaz.* 1915. Mar. Vol. 50. No. 3. pp. 95–97.

The author, who writes from Rangoon, concludes: that Arneth's method is of distinct value in pathology: that there is a shift to the left, of greater or less extent, in several infectious diseases. It is well seen in measles, and is pretty constant in malaria [present in 17 cases, absent in 14]; that there is evidence of a right-shift in some infections, notably in leprosy [right shift in 12, left shift in 3]; that in tuberculosis the shift [to the left] is more pronounced the more advanced the disease: that absence of shift is presumptive evidence against a diagnosis of tubercle or malaria.

A. G. B.

MACFIE (J. W. Scott). **The Significance of Nuclear Variations of Neutrophile Leucocytes (Arneth Counts) in West Africa.**—*Lancet.* 1915. May 1. p. 911.

The author, writing from the Accra Laboratory, states that in a number of cases of malarial fever in which there was a heavy infection with *P. falciparum* the Arneth count showed a well-marked shift to the left, persisting after the disappearance of the parasites and recovery. One case only is referred to in detail: a fatal case, in which 47·6 per cent. of the red cells were invaded and no less than 95·5 per cent. of the neutrophiles belonged to Classes 1 and 2 (Class 1, 78; Class 2, 17·5). The neutrophiles had ingested a large number of parasites and it was possible to gauge the phagocytic power of the cells of the different classes. It was noted that the leucocytes in which the ingested parasites were most numerous were almost always those of Class 1, some of which contained 30 or 40, indicating that their phagocytic activity is not reduced and that ARNETH's view that they are immature is incorrect, and supporting the view of BREINL and PRIESTLEY [this *Bulletin*, Vol. 5, p. 372]. The author concludes by pointing out that in estimating the value of Arneth counts in West Africa the bearing of malarial infections, both recent and remote, must be carefully considered. [The case referred to would appear to be that described in a previous paper (see this *Bulletin*, Vol. 5, p. 243).]

A. G. B.

DOTY (Alvah H.). **The Extermination of the Mosquito.**—*Jl. Amer. Med. Assoc.* 1915. May 29. Vol. 64. No. 22. pp. 1836–1838.

The gist of this communication is that "the extermination of the mosquito can be accomplished only by the destruction of its breeding

place." He refers to the aid that may be given by waterfowl, fishes and bats only to emphasize his belief that no reliance can be placed on these creatures. His own work has been done on Staten Island, New York, where about 10 square miles of salt water swamp land was drained and freed from the breeding places of the "striped legged" mosquito. The breeding ground of this species is sharply marked off from those of the inland mosquitoes. To secure that the necessary measures be carried out uniformly the work must be under some form of official control. A note is added on the use of petroleum oil. This agent is only for temporary purposes. Semi-refined oil should be used; the refined is too thin and the crude does not spread over the whole surface. There is no efficient substitute for petroleum. While it is a valuable temporary agent in dealing with the inland mosquitoes, it is worthless for the destruction of the coast mosquito.

A. G. B.

Salm (A. J.). **Over het vernietigen van muskieten en muskieten-larven,** [The Destruction of Mosquitoes and their Larvae]. —*Geneesk Tijdschr. v. Ned.-Ind.* 1915. Vol. 55. No. 2. pp. 173-179. With 1 text-fig.

In many parts of the tropics it is the custom to keep bath-tubs, and other vessels made of wood, filled with water in order to prevent them from shrinking. Under these circumstances they tend to become breeding places for mosquitoes. The author initiated experiments to see what substances could be added to the water to prevent this development of mosquitoes, and found that the addition of from 1–5000 to 1–10,000 of copper sulphate with sufficient sulphuric acid to prevent deposition, will keep the larvae from reaching the winged stage, though it does not prevent them from hatching out from the egg. Lysol in the strength of 1 : 3200 is equally efficacious, but has the disadvantage of communicating a taste to any drinking water that may be subsequently kept in the receptacles, for which reason the copper sulphate solution is generally preferable.

J. B. N.

Bishopp (F. C.). **A Point to be considered in utilizing the Duck as a Mosquito Destroyer.** -*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. June. Vol. 2. No. 12. pp. 767–768.

The author refers to the paper by Dixon [reviewed in this *Bulletin*, Vol. 5, p. 309] and admits the value of ducks as mosquito destroyers. His object is to draw attention to the habits which ducks have of digging holes in moist ground. He has observed excavations four to six inches deep and in two instances has found mosquitoes breeding therein. The holes may become inconspicuous by the growth of grass. "The question of smoothing up yards where ducks have been kept should not be lost sight of."

A. G. B.

Galli-Vallerio (Bruno) & Rochaz de Jongh (Jeanne). **Studi e Ricerche sui Culicidi. 10ª Memoria.** [Studies and Researches on the Culicidae.]—*Malariologia.* (*Propaganda Antimalarica*). 1915. Apr. 15. Vol. 8. No. 1–2. pp. 9–11.

Some interesting observations on the hibernation of mosquitoes in the neighbourhood of Orbe, Canton of Vaud, Switzerland. Larvae of *Anopheles nigripes* were found on the 17th September at an altitude of 900 metres above sea level (nearly 3,000 feet) in a cavity in a fir-tree. Larvae and nymphs of *C. pipiens*, *C. nemorosus* and *Theobaldia annulata* were numerous in ditches between October 20th and November 3rd 1912. Larvae of *Anopheles bifurcatus* were found about the same date. Throughout the winter larvae of both Culex and Anopheles continued abundant. On the 1st of January 1914, larvae of *C. nemorosus* were found in pools in woods, covered with ice of a thickness of one centimetre, and on the 9th of February larvae of *Corethra velutinus*. Nymphs of *C. nemorosus* appeared in the ditches on the 26th of April, the temperature of the air being 13° C. and that of the water 17°, but nymphs of *A. bifurcatus* did not appear till May.

J. B. N.

Ross (Ronald). **Louis Daniel Beauperthuy and Mosquito-borne Diseases.** [Correspondence].—*Lancet.* 1915. Mar. 6. pp. 513-514;
Balfour (Andrew)—*Ibid.* Mar. 27. p. 675.
Ross (Ronald).—*Ibid.* Apr. 3. pp. 725–726.

Ross takes exception to a remark made by the reviewer suggesting that Beauperthuy's name is at least as worthy of mention in the ranks of the early mosquito theorists as that of King. He is supported by Seidelin, who quotes passages from Beauperthuy's works to show that the latter has been over-rated by Boyce and Agramonte. Balfour replies giving reasons for his belief that Beauperthuy's work has at least equal merit with that of King, and criticising some of the arguments advanced by Seidelin. Ross comments upon this letter, and there for the present the matter ends, but a paper by Blanchard, the publication of which has been delayed by the war, is likely to throw fresh light on the subject which, though not very important, has a certain historical interest.

A. B.

Ringenbach (J.) & Guyomarc'h. **Notes de Géographie médicale de la Section française de la Mission de délimitation Afrique équatoriale française-Cameroun en 1912-1913. Variole.—Paludisme.—Maladies vénériennes.—Maladies du tube digestif.—Maladies cutanées.—Appareils locomoteur, circulatoire, nerveux, génito-urinaire.—Affections des organes des sens.—Intoxications.—Envenimations.—Affections chirurgicales.**—*Bull. Soc. Path. Exot.* 1915. Apr. Vol. 8. No. 4. pp. 199–208; May. No. 5. pp. 301–313.

In this paper the authors deal at some length with the diseases met with in the country traversed by the Commission engaged in delimiting the boundary between the Cameroon and French Equatorial Africa in 1912–13. Native methods of treatment and native beliefs regarding disease are noted and, as far as it could be ascertained, the medical history of the parts visited.

Smallpox.—Between the sea and the Sangha River not a single pocked native was seen. This is explained by the isolation in which the peoples concerned have hitherto lived. Beyond the Sangha the disease was found endemic. The necessity is urged of introducing at once the practice of vaccination.

Malaria.—Malaria is very common but rarely severe. Blood smears were obtained from children in the villages traversed and brought to France. Unfortunately most became overgrown with moulds. Of those that could be examined 67 per cent. from children under five contained parasites, and 61 per cent. from children over five. Quartan parasites were most common, malignant tertian less so; parasites of benign tertian were not seen.

Syphilis.—External manifestations of this disease were noted in 48 of 1,500 natives between the sea and the Ivindo, 90 out of 2,250 between the Sangha and the Lobaye and 11 out of 200 between the Lobaye and the Ouham; i.e., 3·2, 4·0 and 5·5 per cent. respectively. Visceral and nervous syphilis are very rare in this region. Ocular symptoms were not met with. Hereditary syphilis is very rare; Hutchinson's teeth were never seen. Syphilis is often spread by eating with the fingers from a common receptacle, and by sharing drinking cup and pipe.

Gonorrhoea is rare except in the neighbourhood of stations, where it rages. Stricture is the most common complication.

Stomatitis is common and is attributed to mutilation of the teeth leading to caries, or to strongly spiced food.

Helminths.—*A. lumbricoides* is very common. Eggs of ankylostomes were often seen but no severe case of ankylostomiasis disease. *Tricocephalus trichiuris* is common, *Oxyuris vermicularis* less so. No tape worm eggs were seen. Pigs and cattle seldom form part of the food of the native and the pumpkin seeds which he eats daily would get rid of any tape worms that existed.

Dysentery.—Only one case was seen. From the clinical characters and absence of amoebae it was believed to be bacillary.

Malignant tumours were not seen.

Skin diseases.—Those met with were itch and phthiriasis (very prevalent), chigoes, trichophytosis of the scalp (common). Sores and ulcers were seen everywhere, often complicated with phagedaena. "Cro-cro" is frequent. This begins with a vesicle-pustule that breaks and becomes covered with a crust under which pus collects; when the crust is removed there is seen an ulcer without excessive granulations, the edges perpendicular, the base of the colour of wine lees, with no tendency to cicatrise; enlargement of glands is rare. It is found on the legs especially after walking through marsh. Healing occurs in a fortnight or a month, leaving a brownish permanent cicatrix. Boric acid in flakes renewed every third day gave the best results.

Attacks of "rhumatisme" are common, but no diseases of the vascular system were seen. Hydrocele was common; the authors attributed it to filarial disease. Three cases of deaf-mutism were met with.

Filariasis, leprosy and yaws have been dealt with in other papers.

A. G. B.

Siler (J. F.). **Medical Notes on Barbados, British West Indies. Part One: General Information Concerning Barbados; Its Prevailing Diseases.**—*Amer. Jl. Trop. Dis. & Prevent. Med.* 1915. July. Vol. 3. No. 1. pp. 46–63. With 1 plate & 1 chart.

In September 1913 Dr. Sambon invited the Thompson-McFadden Pellagra Commission to send a representative to accompany him on a tour of certain islands of the British West Indies for the purpose of investigating the epidemiology of pellagra. The author was selected and reached Barbados in October. The island is about 21 miles in length by 14 in width, with an area of about 166 square miles [rather less than the Isle of Wight]. Its formation is coral with, on the eastern coast, an outcrop of clay. The island is flat, rising gradually from the western coast to an altitude of 1,100 feet. The coral is about 250 feet deep, resting on impermeable clay. The drainage is excellent. The climate is equable with but little variation—76°–86° F. The population (1911) is thus stated: White 12,063, black 118,387, mixed 41,533, total 171,983. There are 1,034 persons to the square mile. The chief industry is the cultivation of sugar cane. All the inhabitants of the island are supplied by pipes with pure water from a common source. The rainfall filters through the coral stratum and collects in the so-called subterranean rivers, from which it is pumped up. The chemical analysis shows a high degree of chemical purity; bacteriological examinations have been negative. The author writes: "As a sanitary measure the water supply of Barbados is most impressive." The houses are wooden and small, about 12 by 14 feet.

"Formerly it was customary, at night, to close all doors and windows, excluding practically all fresh air. Now the peasants are beginning to use open slat work for doors and windows, permitting free access of fresh air. We were informed that this sanitary improvement was one of the direct benefits resulting from emigration to the Canal Zone. It was stated that Barbadian laborers working on the Panama Canal lived under much better sanitary conditions than at home. On returning to Barbados they break away from the habits and traditions of centuries and put into actual practice some of the sanitary improvements to which they became accustomed on the Zone."

Disposal of Excreta.—With the exception of filariasis the most important prevailing diseases of known etiology are intestinal in character, owing to the faulty disposal of excreta. Of 1,235 premises inspected in 1913 more than 50 per cent. had no visible means of disposal. Of the cesspits in use few are impermeable. Excreta are frequently dumped on unoccupied land.

A table is given of foods imported and there is an account of the dietetic habits of the natives. The organisation of the medical service is described; it is regarded as "most excellent."

Prevailing diseases.—Typhoid fever has always prevailed extensively owing to the methods of disposal of sewage. Between January and October 1913 between 450 and 500 cases were notified. Diarrhoea, and both bacillary and amoebic dysentery are common. There are about 300 lepers, 150 of whom are voluntarily confined in a leper asylum. Tuberculosis has an extensive prevalence, which however is said to be lessening owing to the change in the construction of the peasants' houses.

No routine blood examinations have been made to determine the percentage of the population harbouring microfilariae. Elephantiasis is said to be decreasing quite rapidly; the decrease is attributed to the mosquito control work initiated for the extermination of *Stegomyia fasciata* in 1908, *Culex fatigans* being controlled at the same time.

Malarial fever, as is well known, does not originate in Barbados. The author brings forward reasons for the absence of anophelines such as have already been submitted [this *Bulletin*, Vol. 5, p. 441, and elsewhere]. Occasional cases of beriberi are seen, always imported. The diet of the peasants is largely carbohydrate; almost all the rice imported is highly polished; however, they eat beans and peas habitually and "this fact probably accounts for its absence." Hookworm disease is very prevalent. Yaws is not found, though very prevalent in Jamaica. Sprue is very common.

[Dr. G. C. Low examined the night blood of 600 Barbadians (negroes, mulatto, and whites) in 1900 and found 12·6 per cent. to harbour filariae. (*Jl. Trop. Med.*, 1901. Vol. 4, p. 283–5).]

A. G. B.

Ammerman (C. C.). **Medical Experiences in the Amazonian Tropics.**—*U. S. Naval Med. Bull.* 1914. Apr. Vol. 8. No. 2. pp. 270–280. With 14 figs.

This paper, which has only recently come to hand, was read before the College of Physicians of Pittsburgh in November 1913. The author related some of the medical experiences met with during the years 1911, 1912 and the early part of 1913, while he was serving as divisional surgeon of the Madeira-Mamore Railway Co. in Brazil and Bolivia. This railway serves all that north-eastern portion of Bolivia east of the Andes Mountains that is drained by the Beni and Madre de Dios Rivers, and its purpose is to connect the ports above and below the Madeira rapids.

"The railroad is built on Brazilian territory, paralleling the Madeira and Mamore Rivers. It extends from Porto Velho, near Santo Antonio, in the State of Amazonas, south to Guajara-Merim, in the State of Matto Grosso. It is 366 kilometres, or about 227 miles, in length. It was commenced in September, 1907, and finished in July, 1912. The cost of construction was about 10,000 lives and $32,000,000.

"An attempt to build this road was made in 1878, but was abandoned after about nine months and the death of nearly all the original party."

A hospital was maintained near Santo Antonio containing about 600 beds. Between November 1907 and December 1912 the total admissions were 31,360 and the deaths were upwards of 6,600. The medical corps consisted of about 25 physicians and surgeons, under the direction of Dr. Carl Lovelace. The labourers and employees came from all parts of the world. The principal diseases met with were malaria, blackwater, dysentery of all kinds, abscess of the liver, yellow fever, beriberi, typhoid fever, tuberculosis, pneumonia, yaws, tropical buboes, uncinariasis, filariasis, and tropical ulcers. In this paper the author deals with malaria and yellow fever only.

He states that more disability, suffering and death were caused by malaria than by all other diseases and injuries combined. All the forms were seen, but by far the greater number of cases were estivo-autumnal. There was a great tendency to adynamic conditions and

many patients died in a few hours from the onset. After apparent recovery there was great liability to a return of fever at regular intervals of days, weeks or months: in the case of an American the attacks recurred every second month at the same time for eighteen months. Such sanitation measures as could be carried out were taken. Every man was instructed and urged to take from 5 to 10 grains of quinine daily. In treatment it was administered by every route. The author writes:—

"For intramuscular injections we used the 'chloro-sulfate' put up in glass ampoules each containing one-half gram. Our experience with this form of quinine medication was very gratifying. We administered it with a hypodermic syringe at all times and under all conditions—in the hospital, in the field hospitals, in camps, in the palm huts of laborers, and along the right of way, from our motor cars—and had very, very few bad results from sloughing or abscess. . . . Even had we gotten a great number of abscesses and 'quinine sloughings,' I would have continued to use it in this manner, believing that a live patient with an abscess is greatly to be preferred to a dead one without."

His routine method of giving these injections is described. He states that different persons required different doses of quinine as a prophylactic and this dosage could be ascertained only by time and patience; in many cases attacks of fever could not be prevented by any dosage.

"In my own case, after several attacks of fever, I learned that 30 grains per day was necessary. If I dropped back to 25 grains per day I would soon have another attack. As a result of this observation, for over a year I took 30 grains in solution daily, and kept this up until after my return home, when the amount was very gradually reduced until the first of last September, when it was discontinued. I have both given and taken 160 grains per day, intramuscularly, for several days in succession, without any ill effects, with very little tinnitus, and no nausea. Such doses given in the United States would almost render one liable to a charge of malpractice. In spite of these large doses I did not see a case of quinine amblyopia or a case of permanent deafness, although temporary deafness was rather frequently noted."

Yellow fever is endemic in the Amazon Valley; the natives pay little attention to it. It is frequently alluded to by them as "fiebre patriotica" because it removes foreigners, and more particularly "gringos." Great precautions were taken on the railway to avoid the introduction of infection. One outbreak occurred in November 1911 in a town containing about 400 inhabitants. Owing to the measures taken there were no fresh cases after the first ten days. It was demonstrated that it is possible to fumigate successfully more or less openly constructed palm-thatched and palm-walled buildings.

"These buildings were completely covered with heavy canvas extending from the ground up to and over the roof and down to the ground on the opposite side. Both ends of the canvas were then buried under 6 or 8 inches of earth well tamped down, so that when finished the building was completely and thoroughly covered with this canvas; a half barrel of sulphur was placed within the building and ignited, the whole being then carefully kept closed and undisturbed for 24 hours. The floor and the ground under the floor would then be found covered with numberless dead mosquitoes which were removed and disposed of."

The paper is illustrated by 14 photographs showing the type of country, of native, and of building.

A. G. B.

Carr (Donald). **The Diseases most met with in Persia and how they affect Europeans.**—*Jl. Trop. Med. & Hyg.* 1915. May 15. Vol. 18. No. 10. pp. 109–112.

The author's remarks refer entirely to the Central Persian highlands, and more particularly to the Province of Isfahan, which has been his headquarters for the last 20 years. The Isfahan plain is situated 5,300 feet above sea level and has a most delightful climate. The rainfall is only 4 to 6 inches in the year. There are probably not a dozen days on which the sun is not seen. There is frost for two to three months. Possibly owing to the altitude and the dryness of the atmosphere Persia "has a reputation for making people nervy."

Phthisis has lately been very much on the increase among the natives; the increase is attributed to their habit of sleeping many together in a small room without ventilation, and an additional cause probably is the prevalence of opium smoking; tuberculosis of the bones and joints is very frequent among them. Amoebic hepatitis and tropical abscess are not uncommon, and diarrhoea and dysentery are both serious. There have been very severe epidemics of typhus; the mortality amongst those who are looked after is not large; there has been no death amongst Europeans. Pediculi are universal amongst the poorer Persians.

There is malaria, but on the whole of a mild type, chiefly quartan, but benign tertian and estivo-autumnal fevers are also met with. The author can only remember seeing one case of malignant malaria. There was a serious outbreak of cholera in 1904. Relapsing fever is common in the Kerman district. Oriental sore is extremely prevalent, the face and hands being the most common sites; "if protected from irritation the sores usually will not ulcerate, in which case no permanent scar will be left." Ulcers containing spirochaetes and fusiform bacilli are not uncommon. Short attacks of fever frequently occur for which no definite cause can be found. Syphilis is common but signs of the congenital disease are rarely seen.

The most important disease from the European point of view is enteric fever. "Undoubtedly the water supply is chiefly to blame"; the natives are extremely careless in their use of the water. The author suspects that paratyphoid and allied affections are not infrequent. He notes that after five years' service nervous irritability manifests itself amongst the missionaries, which he attributes to excessive expenditure of nervous energy [see also this *Bulletin*, Vol. 3, p. 220 *et seq.*].

A. G. B.

Reed (E. U.). **Medical Work in American Samoa.**—*U. S. Naval Med. Bull.* 1913. Oct. Vol. 7. No. 4. pp. 546–552. With 4 plates.

The health of American Samoa is looked after by the senior medical officer of the naval station, Tutuila. The population (1912 census) is 7,251, of whom 6,659 are Samoans and 179 whites. The author's period of service was September 1911 to April 1913. The most prevalent diseases were dengue, filariasis and elephantiasis, tuberculosis, yaws, hook-worm disease, ascaridiasis, Samoan conjunctivitis, typhoid and dysentery. Most of the deaths were due to tuberculosis, cancer,

filariasis and deep filarial abscesses, and dysentery. Three deaths in the Samoan hospital were attributed to Samoan treatments. Fifty-six operations were performed for elephantiasis and many for abscesses of filarial origin.

"Tr. ferri chloridi, in 2 cc. doses three times a day, continues to be the most effective treatment for acute filarial attacks and is followed to best advantage by potassium iodide; salvarsan, urotropin, and phenocoll have been tried without success. . . . Elephantiasis is located in the legs or genital organs in an undue proportion of cases; probably as a result of partial obstruction of the lymph glands from chronic leg ulcer infections and Samoan tattooing in almost solid colouring from waist to knees. The femoral and inguinal glands of such cases, when removed, are black with pigment."

Tuberculosis of lungs, glands, bones and joints is very prevalent. Only a few children escape yaws. About 70–90 per cent. of adult Samoans harbour the American hook worm, though only about 10 per cent. show appreciable symptoms. Typhoid fever was introduced from German Samoa in 1912 and has been spread chiefly by flies. The bacillary form of dysentery occurs in yearly epidemics, and is spread also by flies. Liver abscess has not been seen and only one case of amoebic dysentery, probably contracted in the Philippines.

A. G. B.

Breinl (A.). **On the Occurrence and Prevalence of Diseases in British New Guinea.**—*Ann. Trop. Med. & Parasit.* 1915. June 30. Vol. 9. No. 2. pp. 285–334. With 8 plates and a map.

This paper embodies the results of two journeys to the coastal belt of British New Guinea undertaken in July and August 1912 and July to September 1913. The coast of New Guinea east of Port Moresby, the capital, is fairly densely populated, the villages ranging in size from three or four houses to large settlements with about 3,000 inhabitants. The medical survey was carried out with all possible care and it is believed that cases of almost all the diseases prevalent in New Guinea have been encountered.

Malaria.—Malaria occurs with varying severity throughout British New Guinea. A spleen census was taken in children and blood films were made of those who showed considerable enlargement. Of 245 blood films taken from native children 132 contained malarial parasites —48 were malignant tertian, 34 simple tertian, and 27 quartan. Of Anophelines *Nyssorhynchus annulipes* and *Cellia punctulata*, ten of the former to one of the latter, were found. It is thought extremely likely that the first named is an intermediary host in New Guinea.

Filariasis.—Thin smears were made from the day blood of a number of men, women and children. Thick films were not used; experience shows that they deteriorate more quickly than thin smears. Blood films could be taken in the day time only. The results indicated that natives living in the coastal belt of east and north-eastern New Guinea harbour filarial larvae in their blood to a greater extent than in the western parts. In the former the infection was about 17 per cent., in the latter about 5. Microfilariae showing nocturnal periodicity were found in some of the carriers. Morphologically the microfilaria of the New Guinea natives does not differ essentially from typical *Microfilaria nocturna*; a table of measurements is given. It is concluded that

there exists in British New Guinea a microfilaria morphologically identical with *Microfilaria nocturna*, but not possessing the typical periodicity, in addition to microfilariae which are only present in the peripheral blood at night time. Only one specimen of *Stegomyia pseudoscutellaris* was collected. The distribution of the disease was patchy. Cases of elephantiasis were seen in varying numbers; some are illustrated.

Curious fevers—

"Four cases of a curious and apparently specific fever were observed in villages on the south-east coast. All four cases showed the same clinical symptoms, which were sufficiently pronounced to suggest a specific fever.

"According to an account given by an employer of native labour, the disease sets in gradually, with an irregular fever. The first symptom noticeable is an icteric discoloration of the mucous membranes and of the sclerae, accompanied by pain in the splenic region. The patients suffer from more or less frequent attacks of continuous high fever, which may last for a few days or even a week, the temperature rising to 105° F. They emaciate considerably. The disease runs a chronic course—one of the patients had been ill for nearly two and a half years—improvement and relapses following each other at irregular intervals. The patients die finally with symptoms of great emaciation and pronounced icterus.

"The examination of the four cases showed a slight enlargement of the spleen and a very marked enlargement of the liver, which in one case extended to five finger breadths below the ribs; the sclerae and the mucous membranes were of a dark yellowish colour. The blood was decidedly anaemic.

"The disease is well known to the natives, and is called 'Gobora' in the Mailu district, and 'Tebi' further east."

No parasites were seen in the blood films excepting malarial parasites in two.

A peculiar disease characterised by arthritis, osteitis and periostitis.—Joint affections and periostitis have been attributed by various authors to yaws. Such cases were met with in New Guinea. The irregular distribution, similarity of the clinical histories, and absence from tropical regions where framboesia is very prevalent, are considered to favour the supposition that the two complaints are separate clinical entities. The disease is very chronic.

"The most prominent symptom is an affection of one or more of the joints, ranging from a hot painful swelling to suppuration and the formation of sores with fistulae in the skin above the joints, which discharge an amber-coloured clear liquid containing floccular particles. At the same time spindle-shaped thickenings of the larger and smaller bones of the extremities become noticeable, which, especially when the small bones of the hand and foot are implicated, may lead to softening and resorption of the bone. Similar sores to those above the joints may make their appearance above the swellings of the bone.

"The disease affects natives of all ages, men, women and children although the majority were young persons. The youngest patient was about eight years of age. . . .

"The foot so affected closely resembles Madura foot without the presence of the typical granules in the pus. . . . In cases where one of the metacarpal or metatarsal bones is resorbed, the fingers or toes become either retracted or even displaced."

More than one case at first suggested nerve leprosy, but a thorough examination excluded this diagnosis. In a later stage ulcers are formed over the affected joints and bones, up to 25 centimetres in length. They show a tendency to spontaneous healing, forming dense scar tissue. The clinical histories are given of four cases and several photographs.

Those portions of this report which deal with skin diseases and ulcerations have been dealt with elsewhere [this *Bulletin*, Vol. 6, p. 132]. A map shows the distribution of malaria, and there is a list of Papuan mosquitos. The reproductions of photographs of patients with elephantiasis, leprosy, juxta-articular nodules, yaws, tic affection of the joints and bones, ulcus tropicum, contracting sore, etc., are exceedingly good.

A. G. B.

Gilbert and Ellice Islands. **Report on Mosquito-borne Diseases in the Gilbert and Ellice Islands.** [Senior Medical Officer B. C. N. O'Reilly.]—5 pp. f'cap. Received in Colonial Office, Aug. 16, 1915.

In his Preliminary Report on Mosquito-borne Diseases in the Gilbert and Ellice Islands Protectorate (March, 1915) the Senior Medical Officer, B. C. N. O'Reilly, states that the Protectorate is remarkably free from such diseases, a freedom which he attributes to its isolation and geographical features. "On a mainly superficial and hurried examination" Anopheles have not been found. It is noted that there are twenty-six islands in these two groups and that with ordinary communication it would take "about three years" to obtain statistics of mosquito-borne diseases. All the specimens collected are Stegomyia. In the Gilbert Islands no mosquito-borne disease is endemic. In the Ellice group elephantiasis is very prevalent and in the Gilbert Islands all the conditions for its spread are found. There are three sources of danger of its introduction—vessels recruiting labour from both groups; mission ships "with the usual exceptions to rules and enactments"; communication by means of trading steamers. It is urged that no person be allowed to travel to or from the Ellice group without a medical certificate stating that he or she is free from microfilaria. If the disease gets a hold in the Gilberts it will be a heavy burden of expenditure.

From correspondence between the High Commissioner of the Western Pacific, a missionary writing from a Theological Training College in Samoa, and the Resident Commissioner, Gilbert and Ellice Islands Protectorate, it appears that the London Missionary Society seeks to obtain relaxation of the rule whereby Ellice women are prohibited from visiting Samoa for training. The Resident Commissioner is against such relaxation. He says that there can be no doubt that this Society is responsible for having brought elephantiasis into the Ellice Islands from Samoa, in the persons of the native pastors and teachers, and that Samoan pastors are now being introduced into the Southern Gilberts. At present only two cases of this disease are known in the Gilberts, one of which has been removed. He advocates that natives of Ellice and Samoa should be prevented from entering the Gilberts till a thorough investigation of the matter has been made. He notes also that Ellice missionaries are visiting New Guinea and are likely to take elephantiasis there, if it does not already exist, and to bring back other tropical diseases to Ellice. He submits that "in the endeavour to carry on the good work of the spread of Christianity, mission societies are apt to overlook the danger of the spread of tropical diseases."

[The Gilbert Islands lie, roughly, half way between the Sandwich Islands and Australia, the Ellice Islands about 10° to the south. Samoa lies to the south-east of each group. The Gilbert and Ellice groups consist of coral atolls. Their total area is 180 square miles, their population 30,000 natives (Malayo-Polynesians), 300 Asiatics and about 300 Europeans. For an account of the diseases prevalent in New Guinea see above. Filarial infection and elephantiasis are noted.]

A. G. B.

KINDLEBERGER (C. P.). **An Epidemic of Measles and Mumps in Guam.** —*U. S. Naval Med. Bull.* 1914. Apr. Vol. 8. No. 2. pp. 243–247.

From careful enquiry it was determined that measles was introduced into Guam* in 1861 and 1888. The first epidemic was a severe one, the second much milder. In May 1913 a case was discovered at the capital, Agaña. Infection was traced to a native stevedore who developed measles in April and was probably infected from a United States Army transport. The disease soon became epidemic. In September the last two known cases of measles developed in Agaña. Of 1,172 houses in that town 718 became infected. The disease caused only 43 deaths, 42 among children. Tables show the complications and the causes of death. Fifteen deaths are ascribed to entero-colitis, 7 to forms of pneumonia and 5 to tuberculosis. There occurred in all at Agaña 6,884 cases. Of the natives on the island 56·23 per cent. developed the disease and the known deaths were only 0·625 of 1 per cent.

It is believed that mumps was unknown on Guam prior to this epidemic; there is no word for the disease in the Chamarro language. It was introduced from an American ship in January 1913 and at the end of the month had become epidemic. There were no deaths attributable to the disease and few complications. In December the epidemic was believed to be over. 6,320 cases were recorded, constituting 51·59 per cent. of the native population.

A. G. B.

* Guam is the largest of the Ladrone or Marianne Islands, lies 1,500 miles east of Manila and contains about 207 square miles.

Book Reviews.

Riley (Wm. A.) [Ph. D.] & Johannsen (O. A.) [Ph. D.]. **Handbook of Medical Entomology.**—ix + 348 pp. Roy. 8vo. With frontispiece and 174 text figs. 1915. Ithaca, New York: The Comstock Publishing Co. [Price $2.00.]

It is no disparagement of this excellent handbook to say that it will find its most useful employment in the hands of the entomologist who aspires to co-operate intelligently with medical and sanitary colleagues. To the medical student also, while still in that larval "preliminary scientific" stage where he is inclined often to regard his pabulum of zoology with some repugnance or reluctance, many parts of the book will be a fine tonic. But to the active medical profession, and particularly to that part of it which works on those frontiers of civilization where insect agencies have, perhaps, their fullest swing against human flesh, and the assistance of the entomologist is far to seek, its value is hardly so obvious; for much of its entomological ingredient is too technical for anyone who is not already well grounded in entomology and, on the other hand, there is more of the "medical" ingredient than is either requisite or necessary for those who are obliged to study animal pathology independently.

The book consists of eleven chapters besides a general introduction (forming Chapter 1) and an ample bibliography.

Chapter 2 deals with arthropods that are directly venomous, among which are enumerated spiders (with particular attention to the notorious *Lathrodectes*), scorpions, certain mites and ticks, centipedes, and of insects those which bite, or sting, or possess urticating hairs or vesicating secretions. The list of venomous species does not profess to be complete, but the toxic aspects of typical forms are discussed, and many of these forms are figured.

Chapter 3 treats of arthropod parasites of man. The authors adopt Braun's definition of a parasite, and so, along with such unequivocal parasites as itch-mites, ticks, lice, bedbugs, fleas, and bots, which are either structurally or physiologically adapted for living exclusively on or within another living organism, they include all the blood-sucking Diptera that attack man. The *Pentastomida* are not enumerated in the list. The habits and the pathological effects of the parasites are described, and methods of compassing their destruction, as well as of treating the smarts and lesions that they cause, are discussed. The chapter contains a good many figures in the text; those illustrating certain parasitic skin diseases are not very informative; those representing *Auchmeromyia*, the male of *Pediculoides*, and the mouth-parts of *Culicoides*, *Simulium*, and *Tabanus* are not very good.

Chapter 4 enumerates some of the mites, myriapods, and larvae of flies and other insects that have been found in the natural passages of the human body, or in the viscera, or in neglected wounds—under the common heading of accidental or facultative parasites; it also contains a key for the identification of the dipterous maggots that may be found in such situations.

An account of the housefly, under the heading "Arthropoda as simple carriers of disease" occupies almost the whole of Chapter 5, "simple" carriers being those that disperse germs of any kind indiscriminately and accidentally. The natural history and habits of the house-fly, in all stages of its existence, are described, its mode of distributing microbes, etc., are considered, and the ways and means of controlling the insect are discussed.

In Chapter 6, which is entitled "Arthropods as direct inoculators of disease," some instances of mechanical infection by biting-flies are given, and the history of the discovery of the connection between fleas, rats, and bubonic plague is narrated.

Chapters 7 to 10 treat of arthropods as essential hosts of specific pathogenic organisms. They cover well-known ground, but are fuller and more explicit in the accounts of the organisms, their development-cycles, their pathological effects, their historical precession, and matters of that kind,

than they are in their treatment of the specific arthropod carriers. In the section devoted to malaria the impressive arguments of the American physician Dr. A. F. A. King in favour of a mosquito theory are summarised at considerable length, but to call such a well-reasoned clue, to one of the roads that may lead towards the hidden truth, circumstantial evidence in favour of *the* mosquito-theory, which depends for verification upon a critical examination and adjustment of several tedious and tortuous lines of proof, is to rate a single phase of pure ratiocination rather too highly. The historical surveys, however, are good, though the epoch-marking researches are not set in any strong relief, the authors apparently leaning to the comfortable doctrine (*vide* the introductory chapter) that great discoveries are as much dependent upon the hour as upon the man, and are gradually turned to shape by the wheel of progress, rather than suddenly bodied forth in any fine frenzy of imagination and inspiration. It may be pointed out that Fedchenko's discovery of the relation of *Cyclops* to guinea-worm seems to have been first communicated to the world in 1869 (not 1879 as the date here appears), and it has been pertinently suggested that the germanized version of the name of this illustrious naturalist ("Fedtschenko") is no longer appropriate.

In chapter 11 the conditional hypotheses of insect transmission of the noxae of infantile paralysis, pellagra, and verruga peruviana are separately considered.

The final chapter consists chiefly of long synoptic tables for the identification of Arthropoda specifically hurtful to man: to those who are conversant with entomological methods they will be extremely useful, but they are too technical for those who are not.

A. Alcock.

Ealand (C. A.) [M.A.]. **Insects and Man: An Account of the more Important Harmful and Beneficial Insects, their Habits and Life-Histories, being an Introduction to Economic Entomology for Students and General Readers.**—343 pp. Demy 8vo. With 16 plates & 100 figs. 1915. London: Grant Richards Ltd. [Price 12s. net.]

This book is intended as an introduction to economic entomology for students and general readers; its range, therefore, is more extensive and its method less intensive than corresponds with the limits and objects of this *Bulletin*. It deals with Arthropoda in their dynamic aspects, as powers of evil and good, and does not profess to take heed of their structure, classification, and zoological relations. Its chapters are of the nature of independent essays, and only those that fall within the proper scope of a medical journal can be considered here.

The chapter entitled "Insects and Human Disease" contains instructive accounts of the infections that are known to be spread among mankind by Arthropoda. The specific diseases attributable to mosquitos, house-flies, tsetse flies, fleas, and ticks are severally reviewed, and the salient biological facts regarding their nature, incidence, and specific manner of dispersal are considered. The doubtfully noxious *Simulium* is included in the survey, but the body-lice and their proven morbific activities are omitted, and no reference is made to the dangers that are believed to lurk in bed-bugs. The illustrations include figures of mosquitoes and other carriers, and typical views of the breeding places of some of them.

Another chapter "On some Human Parasites" contains a good deal of useful information about the flea, the bed-bug, lice, the maggots of *Dermatobia*, *Cordylobia*, *Auchmeromyia*, and *Chrysomyia*, and certain mites. There are numerous figures, most of which are very good, but those of the bed-bug and the larva of the flea are poor and unnatural.

The chapter on insect enemies of livestock is rather more discursive in character, and does not profess to give an exhaustive list of parasites and pests. Along with some good figures it includes a general account of ticks, mentioning some of the tick-borne fevers of domestic animals, and also some well-selected intelligence about bots and other Oestrid maggots, the blow-flies that attack sheep, the Hippoboscid flies, biting lice, the

mites that cause scab, and some of the parasites of poultry. The author indulges in the sport of showing the engineer hoist with his own petard, by adding some remarks on pébrine and the kindred bee-disease to this chapter.

In the essay on beneficial insects there is a section—of interest chiefly to the curious—on insects in medicine.

Household insects have an illustrated chapter to themselves, which is chiefly remarkable for a long excursion on the New Orleans or Argentine ant.

A final chapter on insect control deals exclusively with an aspect of the subject which, though of great importance to the agriculturist and horticulturist, is of little moment to the sanitarian—namely, the suppression of insect pests by subjecting them to the attacks of their natural enemies, parasitic and predaceous.

A. Alcock.

Studi di Medicina Tropicale. Vol. 1. Collezione di Pubblicazioni Scientifiche sull' Eritrea. Compiuti da Ufficiali Medici e Veterinari de R. Corpo di Truppe Coloniali dell' Eritrea.—xvi + 230 pp. With 75 text-figs., 1 map & 2 coloured plates. Pubblicato a cura del Governo della Colonia Eritrea, Asmara. 1914. L'Istituto Italiano d'Arti Grafiche di Bergamo. [Price L. 8.]

The reviewer wonders how many readers of this *Bulletin* could say off-hand in what manner the Italians first obtained a footing on the Red Sea Coast. Thinking that occupation began in 1885 at the time of the quarrel with Abyssinia he looked the matter up only to find that he was wrong. Most colonies have originated in a desire to extend national trade. A rich company with a royal charter would sail for the chosen area to establish factories, or a firm with some experience of foreign trade would send out its agent. If a footing could be obtained a trade centre was established. In most cases trouble ensued sooner or later either through the tyranny of the merchants or the cupidity of the natives. Traders were killed and troops sent out to avenge the death. Land was acquired either by conquest or by treaty and the colony was started under the national flag. Eritrea began in what may be called the orthodox manner! In 1869 the "Rubattino Steam Ship Company" purchased a strip of coast near to Assab and used it for trade until 1882 when the Company sold its rights to the Italian Government. Attempts to appropriate more of the country led to war with Abyssinia and the years between 1885 and 1896 were full of strife, the Italians being more than once defeated by the Abyssinians. In the end Italy became the possessor of Massawah and the coast far to the north of the original area round Assab.

It was not therefore until these years of strife were over that the medical and veterinary officers with the colonial troops could turn their attention to the diseases of the colony and their prevention. The result of the work done is in part contained in the work under review. *Studi di Medicina Tropicale* forms volume one of a series with the title, *Collezione di Pubblicazioni Scientifiche sull' Eritrea*, and it contains the work of eight contributors. Pride of place is given to a full clinical essay on malaria (Dr. Mignacca). Herein are described those conditions favouring the origin and spread of malaria, its symptoms, effects on various organs of the body and its treatment. This and the other essays which the volume contains are furnished with a bibliography. Dr. M. Carpano of the veterinary service contributes a well illustrated article on *Trypanosoma theileri*, which attacks the various breeds of cattle with differing severity. Together with this organism others are found in the blood in many cases. Such are:—*Piroplasma bigeminum*, *T. abyssinica* and *Sp. bovis*. Photo-micrographs are shown of these mixed infections. Pages 33 to 115 contain the results of Dr. Vicenzo de Marzo's experience of the many diseases found in the regions of Barca and Gasc-Setit. General as well as strictly tropical diseases are dealt with and the illustrations, as is the rule throughout this work, are excellent.

Variety of subject is one of the characteristics of the work under review. It includes an article on poisonous snakes and their distribution in Eritrea. The poison fangs and venom of colubrine and viperine snakes are described and the former illustrated. Nothing new is to be found under the head of treatment. Many of the birds of Eritrea are infested with parasite Haemamoeba. Dr. CARPANO gives a list of such birds and describes fully the developmental cycle of *Haemoproteus Danilewskyi*. This article contains two coloured plates showing developmental forms of the parasite and photomicrographs displaying *Haemoproteus* as it is found in the blood of *Gypogeranus serpentarius*, also, in various stages of development, in the blood of *Coracias abyssinicus*. The mosquito hosts and carriers appear to be *Culex pipiens*, *C. annulatus*, and *C. fatigans*.

The next article, another contribution from Dr. MIGNACCA, deals with *Filaria medinensis*, the guinea worm, frequently found in several of the districts of Eritrea. Although containing nothing new the article is interesting and well written. There are two theories as to the method by which the worm enters the bodies of its victims. Some believe that the young worm penetrates the skin of bathers and others walking about in infected water. No actual proof of such penetration is produced. Moreover, it is known that the larval *Dracunculus* spends one stage of its life in the body of one or more species of *Cyclops*. LEIPER found that a solution of hydrochloric acid, equal in strength to the human gastric juice, killed the *Cyclops* setting free the filariae. It would seem therefore that the guinea worm cannot infect man until after the "Cyclops stage." It is most probable and generally accepted that it is through swallowing infested *Cyclops* that man becomes infected. However, as Dr. MIGNACCA recognizes the existence of both theories he is careful to advise protection of the feet and sterilization of drinking water.

The remaining articles do not call for any particular notice. They deal with the teeth of the native inhabitants of the colony, accidents and other cases treated in hospitals, with an epidemic of smallpox and with the climatology of the high lands in Eritrea.

J. H. Tull Walsh.

ASHBURN (P. M.). [Major, Medical Corps, U.S. Army]. **The Elements of Military Hygiene especially arranged for Officers and Men of the Line.**—2nd Edit. viii + 351 pp. Crown 8vo. 1914. Boston and New York: Houghton, Mifflin Co. [Price $1.50 net.]

The second edition of Major Ashburn's "Elements of Military Hygiene" has appeared at a singularly appropriate moment when the necessity for such a manual, written on popular lines and intelligible to the executive of our rapidly growing armies, is sufficiently apparent and the book loses none of its value from the fact that it concerns itself with the training and health of recruits for the United States Army, of which the author himself is a distinguished member. The subject matter is divided into three main parts; the first of which concerns itself with the recruit and his environment; the second with the causes of disease; the third with the prevention and control of epidemics; while there is a terse and well expressed supplement dealing with the prevention of mental and nervous diseases. The work is written in a bright style and explains with singular clearness and in non-technical language all essential points in the examination, training and general health of the recruit, as well as giving simple descriptions of the diseases of military importance and chapters on camp sanitation.

In the examination of the recruit it is of interest to note that the author takes a thoroughly sensible view of the problem of varicose veins; in this the reviewer is in entire agreement that, if moderate in degree, they ought not to present *per se* a bar to active service. The chapter on personal hygiene is well written, more especially the portions devoted to sexual problems and the question of alcohol.

In the subsequent chapter on foods and their preparation several pages are devoted to a recapitulation of the dietary supplied to the U.S. Army

which is on a very liberal scale; in a paragraph on the hygiene of the kitchen due attention is directed to the necessity of examining the chief cook and his staff for past or present evidences of typhoid fever. A full description is given of the various types of incinerator generally in use in camp and the reviewer is in agreement with the author that, however efficient, they require moderately intelligent handling as it is of course possible to smother almost any fire.

As showing the comprehensive nature of the book, in a chapter on hygiene of hot and cold climates the author devotes considerable space to the consideration of the special conditions encountered in the Panama Canal Zone.

In dealing with the prevention of epidemics the carrier problem, both human and invertebrate, in its bearings on military medicine is thoroughly considered; the conveyance of typhoid by means of water and shell fish is still, considering the high rate of incidence of that disease, a burning question in America. This portion of the work ends with a recapitulation of the beneficial effects of cholera and typhoid vaccine, which appear to have been fully borne out during the present war.

The conspicuous part played by the author in the investigation of insect-borne disease is a sufficient guarantee that this important subject receives adequate treatment at his hands and all the more familiar methods of mosquito destruction and prevention are described. One has no hesitation in recommending this book not only to combatant officers, but also to members of the profession about to enter the rapidly-increasing medical corps of the British Army.

P. H. Bahr.

Kenwood (H. R.). [Temporary Lieut.-Col. R.A.M.C.; Professor of Hygiene and Public Health in the University of London, etc.]. **Health in the Camp: A Talk to Soldiers.**—vi + 58 pp. Demy 16mo. 1915. London: H. K. Lewis & Co., Ltd. [Price 3*d.* net. Special terms for large quantities.]

This little book, the scope of which is accurately described by the title, deals with the "germs of disease" and how to guard against them, "the fly danger," "some principles of camp sanitation," "anti-typhoid inoculation," "food," "drinking water," "fresh air," "venereal diseases," "alcohol," "personal cleanliness," "the teeth," "vermin," "sanitary discipline," in fact, "what every soldier ought to know." It is written clearly and in an interesting manner and if read intelligently can hardly fail to benefit the reader and his fellows and to forward health in the camp. A wide circulation may be wished for it apart from the fact that any profits are to go to the Soldiers' and Sailors' Families Association.

A. G. B.

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Note.—On direct application (not through agents or booksellers) any of the foregoing reprints or pamphlets will be sent on loan to any part of the world, the Bureau paying outward postage.

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